DOES NOT CIRCULATE

UNIVERSITY OF MICHIGAN
SEP 27 19
MEDICAL LIBRARY

BULLETIN OF THE HISTORY OF MEDICINE

ORGAN OF
THE AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE
AND OF
THE JOHNS HOPKINS INSTITUTE OF THE HISTORY OF MEDICINE

VOLUME XXXI JULY–AUGUST, 1957 NUMBER 4

IN MEMORY OF HENRY E. SIGERIST

FOUR ADDRESSES DELIVERED BEFORE A SPECIAL MEETING OF THE JOHNS HOPKINS MEDICAL HISTORY CLUB IN ASSOCIATION WITH THE JOHNS HOPKINS INSTITUTE OF THE HISTORY OF MEDICINE 295

MAIN ARTICLES

Maimonides on Medical Practice: JOSHUA O. LEIBOWITZ 309

Comments on Samuel Johnson's Biography of Sir Thomas Browne: MARY FRANCES WAGLEY and PHILIP F. WAGLEY 318

The Rheotome; the First Instrument for Graphic Analysis in Electrophysiology: HEBBEL E. HOFF and L. A. GEDDES (Concluded) 327

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE

Report of the Thirtieth Annual Meeting, Richmond and Williamsburg, Virginia, May 6, 7, and 8, 1957 348

NOTES AND COMMENTS

The Earliest Description of Paralysis Due to Multiple Neuritis Following Diphtheria: MADELAINE R. BROWN 375

MEDICO-HISTORICAL NEWS AND ACTIVITIES

Announcements 376

BOOK REVIEWS 379

CONTRIBUTORS TO THIS NUMBER 390

THE JOHNS HOPKINS PRESS
BALTIMORE 18, MARYLAND

BULLETIN OF THE HISTORY OF MEDICINE

ORGAN OF
THE AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE
AND OF
THE JOHNS HOPKINS INSTITUTE OF THE HISTORY OF MEDICINE

Founded by HENRY E. SIGERIST

Editor—OWSEI TEMKIN

Assistant Editor—JANET B. KOUDELKA

ADVISORY EDITORIAL BOARD

WYNDHAM B. BLANTON — ESMOND R. LONG
GEORGE W. CORNER — RICHARD H. SHRYOCK

Manuscripts, review copies of books, and correspondence relating to the publication of papers should be addressed to The Editor, Bulletin of the History of Medicine, 1900 E. Monument St., Baltimore 5, Md.

Contributors of articles will receive 25 reprints without covers free of cost. An order form for additional reprints, giving the cost, is sent with the galley proof.

The Bulletin is published bimonthly. One volume of at least 500 pages is published during the year. The subscription rate is $6.00 a year in the United States and countries of the Pan-American Union, $6.25 in Canada, and $6.50 in other foreign countries. Single numbers when available are $1.50 each. Prices for back volumes may be had on application. Volume I is out of print. New subscriptions are entered to begin with the first issue of the current volume.

Active and Non-resident Members of the American Association of the History of Medicine receive the Bulletin on payment of $6.00 annual dues, of which $5.00 is for a year's subscription. Constituent Societies pay $10.00 annual dues, of which $6.00 is for a year's subscription to the Bulletin.

Claims for replacement of missing numbers must be received within 3 months (6 months in the case of foreign subscribers) following publication of the number.

THE JOHNS HOPKINS PRESS

BALTIMORE 18, MARYLAND, U. S. A.

PUBLISHED BIMONTHLY

January-February, March-April, May-June, July-August, September-October, November-December

Made in United States of America

Entered as second-class matter January 3, 1935, at the post office at Baltimore, Maryland, under the Act of March 3, 1879.

HENRY E. SIGERIST

BULLETIN OF THE HISTORY OF MEDICINE

ORGAN OF
THE AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE
AND OF
THE JOHNS HOPKINS INSTITUTE OF THE HISTORY OF MEDICINE

VOLUME XXXI JULY–AUGUST, 1957 NUMBER 4

IN MEMORY OF

HENRY E. SIGERIST

M. D., D. Litt., LL. D., D. Sci., Dr. h. c.

The following addresses by some of Dr. Sigerist's former associates and his successor at the Johns Hopkins Institute of the History of Medicine are here printed in the sequence of their delivery at a special meeting held by the Johns Hopkins Medical History Club in association with the Institute to honor the memory of Dr. Sigerist. Dr. Victor A. McKusick, president of the Club, opened the session with a short biographical sketch of Dr. Sigerist.

Born on April 7, 1891, in Paris, of Swiss parents, Henry E. Sigerist received his M. D. degree from the University of Zurich in 1917. After a period of medical service in the Swiss Army, he devoted himself to the study of the history of medicine and taught at the Universities of Zurich and Leipzig, succeeding Dr. Karl Sudhoff in the last named place. In 1932 he settled in Baltimore as Director of the Institute of the History of Medicine and Professor of the History of Medicine at The Johns Hopkins University. In 1933 he founded the *Bulletin of the Institute of the History of Medicine,* which, with a change to its present title, in 1939 became the official organ of the American Association of the History of Medicine as well. He resigned from his position at The Johns Hopkins University in 1947 to devote himself to medico-historical writing at his new home in Pura, Switzerland, where he died on March 17, 1957.

OWSEI TEMKIN:

I vividly remember the afternoon on which I first saw Dr. Sigerist. I was a medical student at the University of Leipzig entering upon the lecture course on medical history offered by the new professor who had but recently succeeded Geheimrat Sudhoff. There I sat in the lecture room wondering what the professor would look like. The door opened and in a few long strides he reached the reading stand. The first impression still stands out in my mind: the professor appeared much more a man of the world than one expected a German professor to be, and his movements and eyes looked so young. Though the details of the course have become submerged in my memory, I am conscious of the general and lasting effect. Here I learned to look upon medicine as the result of a development, and here were impressed upon me the main stages of the process.

I mention those early days in Leipzig when Dr. Sigerist was not yet the famous man he was to become a few years later, because even then he showed two of the approaches on which the significance of his work in medical history rests. One day in his lecture he passed around the proof of a book on which he was engaged jointly with the Zurich classicist Howald. It was the Herbal of Pseudo-Apuleius, an early medieval Latin work. The text was available in a great number of manuscripts, and the editorial difficulties had taxed the ingenuity of scholars before. The work demanded meticulous care and attention to detail. It was of a kind where perfection is expected and even slight mistakes are criticized severely. But then, at about the same time, I had the privilege of hearing his introductory lecture at the University. It dealt with the historical contemplation of medicine. With a wide sweep he viewed the history of medicine within the context of culture and civilization. The lecture was influenced by ideas of Spengler, ideas to which Dr. Sigerist did not adhere for long. But for those who heard the lecture it opened new vistas in which the history of medicine was no longer represented as the isolated development of a self-contained discipline.

Philological analysis and cultural synthesis were the two main approaches of Dr. Sigerist to medical history. I am not concerned here with those studies to which he referred as Sociology of Medicine. Speaking of his historical work proper, it has always seemed remarkable to me that he pursued these two approaches somewhat independently from each other. When I was a young beginner he encouraged me to do some manuscript work because in his opinion a well-rounded historian of medicine should

be able to work philologically too. Himself a master of many languages, he had chosen the field of early medieval medicine. This was due to the influence of his teacher Sudhoff under whom he had begun his work on early medieval prescriptions. I mentioned the Pseudo-Apuleius and should refer to the edition of many texts by himself and his pupils. When Dr. Sigerist came to this country he was planning a critical catalog of all early medieval medical manuscripts. He devoted summers of research to this task, photographing or having photostats made which were incorporated into the Institute collection. Unfortunately he gave up these plans, but at least he described and analyzed many of his findings in a series of beautiful articles published in the *Bulletin*. This side of his work to which we owe much new knowledge represents the professional historian and it may be the reason why he is sometimes considered a medievalist. I doubt that such a designation was to his heart. Early medieval medicine to him was a field of special interest, not a specialization. The mere recital of titles referring to detailed work in other periods, for instance his edition of Haller's letters to Gessner, would suffice to prove my contention.

But texts, even medical texts, can be edited by scholars with little interest in medicine. I believe that Dr. Sigerist considered it a more important function of himself *qua* medical historian to make the development of medicine understandable against the background of all factors that shape our civilization. Those who attended the first Graduate Week at the Institute in 1938 will remember the meeting of our Medical History Club devoted to the theme of disease and music in which a lecture by Dr. Sigerist was followed by the performance of old music dealing with syphilis, tarantism, and the plague. The manifold interrelations between disease and civilization fascinated him and were studied at length in his *Civilization and Disease* of 1943. The other two works in which he offered a synthesis of medicine were his introduction to medicine, known under the misleading title of *Man and Medicine* of the English translation, and the *Great Doctors*.

Man and Medicine grew out of lectures to freshman medical students. It demonstrates the developmental coherence of what we call medicine; it is the convincing application of the historical method to show the unity of a subject. The first, German, edition had a tremendous success and made Dr. Sigerist famous almost over night. But when I am asked which of Dr. Sigerist's books I like best, my answer is: *The Great Doctors*. This may be a very subjective preference. We are all too close to Dr. Sigerist in time to view his life and work objectively, and we may even con-

tradict one another. To me, the *Great Doctors* represents a remarkable achievement. Supposedly a series of biographies it does not concentrate on biographical detail. It becomes a history of medicine in which the great doctors are points in its development. And yet, nowhere does the reader lose the feeling that he is dealing with men, not mere representations of abstract historical forces. Dr. Sigerist had a strong sense for historical personality; his love for commemorating the birth and death of men like Paracelsus and Vesalius bears witness to this.

To my mind, the *Great Doctors* shows Dr. Sigerist's mastery of the material, his instinct for avoiding factual historical mistakes and his great power of charming and stimulating a large audience. I do not mean to say that even in his strictly historical studies he was always right in what he said. But he had the enviable ability to avoid unnecessary commitments on doubtful historical points without, on the other hand, making the reader aware of any omission. Of course, the *Great Doctors*, like most of his other publications, beginning with the booklet of 1927 on ancient medicine and ending with his *Landmarks in the History of Hygiene* of 1956, are popular writings, if by popular we mean what is readable and understandable without specialized knowledge. "Popular" in this sense is intended as high praise. Yet we may wonder whether Dr. Sigerist did not feel the need for bringing his detailed philological work and his wider comprehension together in a work that would combine both approaches.

In order to understand why Dr. Sigerist delayed the fulfillment of that need for so long, it might be well to remember the many-sidedness of his occupation as a medical historian. No appreciation of Dr. Sigerist as a medical historian would be complete without mention of his organizational role, particularly where the American Association of the History of Medicine is concerned, and his editorial work to which the *Bulletin* and various series of books testify. He was not a copy editor. I am afraid that the early years of the *Bulletin* were trying days for Mr. Dittus of the Johns Hopkins Press. Dr. Sigerist organized; he edited journals and founded series of books because he felt a strong urge to further medical history and to represent it in its many shades. He needed an outlet for himself and his associates, but he would accept material of any kind, provided that he considered it worthy of print.

When he left Baltimore in 1947, he had started upon an eight-volume history of medicine that was to be the crowning of his life's work as a medical historian. The first volume appeared in 1951, covering archaic medicine, bringing together all the knowledge we have of the types of medicine of that period, viewing them in the perspective of the general

development of the nations dealt with. Medical history had never before been written against so broad a background, and yet here, as elsewhere, Dr. Sigerist remained a medical historian who did not look upon medicine from outside, so to speak.

The plan to write an eight-volume history was in agreement with views he had mentioned to me many years before, views which expressed his desire to retire as early as possible to be free for creative work. The plan was not fulfilled; whatever else may exist in manuscript form beyond the first volume, the history is a torso. This is a tragedy to which we must resign ourselves just as he had to resign himself to ill health that impaired his power of expression during the last years of his life. We can only accept what he has given us and be grateful that there is so much of it.

RICHARD H. SHRYOCK:

It is peculiarly difficult to think of Henry Sigerist as a scholar or teacher without recalling him as a man. But some of you knew him better than I—here in this Institute, or elsewhere—and it would be hardly fitting to impose on you my own limited though vivid recollections. Instead I would call attention only to one aspect of his work which was of especial interest to American historians; namely, to the influence he exerted upon medical history in this country.

One of the perennial debates among historians concerns the rôle of the individual—and particularly of outstanding individuals—in any given setting. Did the man create his times; or the times, the man? Sigerist himself has something to say on this theme in his *Great Doctors*, where each medical leader's debt to his environment is recognized but where his contributions to the larger outcome are also made clear. In the hands of most authors, a work of this nature would have simply presented biographical sketches; at best, a number of cross-sections of medical thought at separate intervals. Instead, the *Great Doctors* actually brings out the major trends in medical history—not just as abstractions but in terms of real men who made and were made by these developments. Continuity appears within diversity. Hence this book presents the most happy synthesis of individuals and of their backgrounds—of what biographers call "life and times"—of any full-scale narrative which I know.

Dr. Sigerist's impact on medical history in this country may be viewed as a case in point; that is, as an illustration of the interplay between an outstanding individual and his environment. He himself called attention to some formative influences in his European background;

for example, to the stimulus provided by George Sarton before either of them had migrated to America. Upon arriving here, moreover, Sigerist found the stage set in part for the rôle to which he was devoted. There was an Association of Medical History, located largely in Philadelphia, and Welch had founded an Institute in Baltimore. I would not claim, however, that "the time was ripe" for serious interest in medical history here around 1930; rather, to continue the botanic figure, we might say that a few shoots had begun to sprout. Would they ever come to fruition?

Dr. Sigerist's rôle in encouraging this growth is familiar to all of us; yet, just because of familiarity, it is easy to understimate his remarkable impact. Need I remind you of the objective facts—of the building up of the Institute, of the founding of its *Bulletin* and of other publication series, of the reorganization of the Association, and of the establishment of several full-time posts in medical history elsewhere? In each of these developments, occurring within less than a decade after 1932, Sigerist was the moving spirit.

It is quite unlikely, I think, that anything like this would have occurred but for the influence exerted by this one scholar. Here and there, no doubt, some would have given heed to medical history, but I doubt if there would have been anything like the awakening which actually ensued—not, at least, for some time. There would have been a few publications but nothing of what historians like to call a "movement."

Although I am constrained here to speak impersonally, none of us has the illusion that all this was accomplished impersonally. For great as were Sigerist's ability and reputation as a scholar, it seems obvious that these alone would never have brought about the outcome. It was rather the combination of ability and of an unusual personality which enabled Sigerist to make so marked an impression in this country. In addition to his ideas, it was his simplicity, his outgoing nature, and above all his enthusiasm and verve which stimulated so many who came into contact with him.

Medical history, as a field, still has its limitations and some of us worry about this at times. But my point here is that, had it not been for Sigerist's work, this situation would have been taken for granted—it would not even occur to us that there was anything to worry about. The field is different and more promising than it would have been without those crowded, fifteen years in Baltimore. Dr. Sigerist did not create or terminate the major trends—no individual could—but he gave them an impetus such as is rarely provided by one man. This, we shall not forget.

SANFORD V. LARKEY:

One of the things that particularly impressed me when I first met Henry Sigerist in 1932, was his great knowledge and understanding of this country, although it was his first visit. I soon found that it was only typical of his broad interests and enthusiasms for all phases of history and culture.

I had the pleasure at that time of driving Henry from San Francisco to Los Angeles. As we went leisurely down the coast road we stopped at the old Spanish missions, which entranced Henry. As usual, he had his Leica with him and took many beautiful photographs. On the stretches of road between stops we had long chats on art and history. But he was equally interested in the vagaries of Los Angeles architecture, if you can call it that. He was always stopping me to snap a picture of some extravagant building, such as the "Brown Derby" or of some outlandish billboard. I remember one sign that particularly amused him. He had just come back on a very stormy voyage from Honolulu. The sign with an inviting scene at Waikiki read: "Hawaii—just a wave or two away!"

One night we went to the Pasadena Playhouse and afterwards spent most of the rest of the evening with some friends of mine who worked with the Playhouse. Here Henry revealed another interest. He completely captivated the group with what he knew of European drama and of the contemporary theatre.

Henry was very catholic in his tastes. He was interested in almost all aspects of Art, Literature, Drama and the Theatre, and Music. Besides, he had two other rather practical avocations—photography and cooking. But all of these were more than mere hobbies. They were an integral part of his nature and thought, and colored all of his writing. One can give only a few illustrations of how he brought these other subjects into his own work.

In his book *Civilization and Disease* he has chapters on "Disease and Literature," "Disease and Art," and "Disease and Music." In these he summarizes much of his early work. In literature, I think that the writer that had the greatest influence on him was Zola. He was particularly impressed with the influence of science and medicine on the French writers of the period. Of Zola he says: "In 1880 Zola wrote a treatise *Le Roman Expérimental* which he thus named in analogy to Claude Bernard's book. His thesis was that the novel must be scientific and experimental describing human beings as they are, conditioned by their environment, and analyzing the mechanism of human passions, thus constituting studies in applied

sociology."[1] In turn, Henry applied many of these principles to his own writing.

Those of you who remember the first Graduate Week in the History of Medicine will recall that one night of the program was devoted to "Music and Medicine." A highlight of this evening was the playing of a Tarantella, culled by Henry from Athanasius Kircher, supposed to be effective in curing Tarantism. This is described in detail in the chapter "Disease and Music," in *Civilization and Disease*.

It is probably the realm of art from which Henry drew his most striking and effective analogies. He was interested in art in all of its forms—painting, sculpture and architecture—and particularly in the medieval, renaissance and baroque periods. In many of his works he explains the medical thought of a period in terms of the art of the period. Thus he relates Harvey's work on the circulation to baroque art: ". . . the Baroque artist saw the world in motion, in action."[2] "So Harvey is the man in medicine who first embodied the Baroque conception of the world. . . . In this way physiology, the functional conception in medicine, was an outcome of the Baroque spirit and Harvey takes his place in the rank and file of such men as Michelangelo and Galileo, who brought about the same sort of change in the realm of physics, a change from the static to the dynamic."[3]

Travel, which Henry loved, gave him an opportunity to set forth his many other interests along with the description of the scholarly purpose of his trips. His Leica was always along. He used it to photograph medieval manuscripts, developing the films, as he tells us, in the bathtub at his hotel. But he also used it to take pictures of places and people, and we can be glad he did, for he used them as illustrations in his delightful travel reports, to Italy and France in search of medieval manuscripts, and to Yugoslavia, just before World War II.

In Yugoslavia, aside from the conditions in the country and the beauties of the scenery, two things impressed him most, the artistic creations of Meštrović, the great Yugoslav sculptor, and the work of Štampar in public health. He closes his report with a typical analogy: "Meštrović has carved the Yugoslavian men and women in stone, their destinies, their sufferings and joys. Štampar has carved the smile in the face of the mother whose child he saved, and has erected for himself a monument in the heart of the Yugoslavian peasantry. Nobody knows what the future of Yugo-

[1] *Civilization and Disease*, Cornell University Press, 1943, p. 189.
[2] The historical aspect of art and medicine. *Bull. Hist. Med.*, 1936, *4*: 295.
[3] *Man and Medicine*, Norton, 1932, pp. 34-35

slavia will be, but I know that the creations of these two men will live forever." [4]

A quotation from his experiences in Poitiers shows three of his interests competing: "It is not easy to work at the library of Poitiers, although it is open daily with the exception of August and September. It is difficult to work there because before you get to the library you have to pass Scylla and Charybdis. Two cliffs are in your way, and you have to circumvent them if you want to reach your goal.

"One of them is the *Restaurant du Chapon Fin*, one of the great temples of gastronomy. As the library is closed in the morning and opens only at one o'clock, the best you can do is to have lunch at the Chapon Fin—and what a lunch! How delightful it would have been to sit in such a place with Dr. Welch. He who was never particularly keen about lecturing would have delivered spontaneously one of his great lectures. He would have told me that the human alimentation has aspects that are not studied at the School of Hygiene—at least not officially—that the preparation of food is an art. The cuisine is one definite aspect in the history of civilization. Each period stamped its dishes with its style. The *meringue* is a creation of the baroque and you cannot eat it without being reminded of Bernini." [5]

To digress from Poitiers for a moment, I want to say that while Henry, like Dr. Welch, was a gourmet in the best sense of the word, he was more than that. He was a great cook. He gives his recipe for truffled turkey with sauce Périgueux in an article on *American Truffles*.[6] I can attest to his statement "This truly is a delicious dish." He was an artist here as in everything else. He dressed the part with a tall chef's hat on his head and every step followed an elaborate ritual. But it was a strain on the household. Everyone was at his beck and call and the normal routines were disrupted. As Mrs. Sigerist once said "Henry uses more butter and dirties more pots, pans and dishes for one meal than I do for a week."

To return now to Poitiers, and the other cliff. "If you have succeeded in escaping without indigestion, you will cross the Place d'Armes, and soon reach a building that was formerly a hospital, the Hôtel-Dieu, and is today a university building, and at the same time the seat of the municipal library. But here another cliff is waiting for you. Right in front of the library is the church *Notre-Dame-la-Grande*, a wonder of roman-

[4] Yugoslavia and the XIth International Congress of the History of Medicine. *Bull. Hist. Med.*, 1939, *7*: 147.

[5] A summer of research in European libraries. *Bull. Hist. Med.*, 1934, *2*: 589-591.

[6] American truffles: A Thanksgiving fantasia. *Bull. Hist. Med.*, 1944, 16: 402-409.

esque architecture. A 12th century façade not much higher than it is broad, three bold arches, three rows of arcades, sculptures illustrating the life of the Virgin, and in the middle, as in a seal, a statue of Christ, surrounded by the symbols of the evangelists. You stare and dream and begin to visualize the ideas and ideals of the 12th century—until you suddenly remember that the library closes at 5 P. M., and that you have to examine a manuscript of which very little is known."

I think his final remark here epitomizes what all his other interests meant to him: "I did not leave Poitiers without visiting the church of Saint-Hilaire-le-Grand. These great romanesque buildings are the best possible illustration of the period whose medicine I am studying. They throw light into the "Dark Ages" more than any literary document could ever do."

It is a great loss to the history of medicine that he was not spared to finish his monumental history of medicine and public health, but I think that all of us will also miss these other sides of Henry Sigerist.

LUDWIG EDELSTEIN:

Those who spoke before me talked about Dr. Sigerist as historian of medicine, about his contribution to historical studies in this country, about the world traveller who enjoyed life and its beauty, his devotion to research notwithstanding. It seems fitting that this hour of remembrance should not close without a few words being said about the particular qualities that distinguished his scholarship, about his personal qualities that made him so widely respected and loved.

To speak of him here, in the room in which he himself used to lecture, I find no easy undertaking. One feels as if he were present, as if one could hear his sonorous voice, could see his quick and somewhat nervous gestures. Thus the memory of one's association with him grows even more vivid; what he meant to oneself, the feeling of one's personal indebtedness to him impairs all objective thought of his achievement. Perhaps it will be best, therefore, if I take my departure from a brief autobiographical statement made by Dr. Sigerist in the last book he was to publish. Written in an introspective mood that may already have been colored by the premonition of death, his remarks seem intended to sum up for himself and others his aims and aspirations, and do indeed provide a clue to the understanding of his work and of his nature.

"Looking back after many years," he says in the preface to his *Landmarks in the History of Hygiene*, "I think that what determined my career was that I steadily refused to specialize. All my teachers wanted

to make me a specialist. . . . But my interests were very broad." This statement refers to the young student who delved into philology, history, science, and medicine. To be sure, it also characterizes the mature man. It would be impossible to circumscribe Dr. Sigerist's scholarship by the narrow boundaries of any departmental subject. His was a truly comprehensive outlook. Languages, the humanities and the sciences fascinated him in equal measure, and one is tempted to speak of him, in the parlance of the day, as a generalist rather than a specialist.

However, a generalist is a person who programmatically decides not to specialize. Dr. Sigerist's breadth of interests, his refusal to restrict himself to one particular field, was the outcome of his innate curiosity. General pronunciamentos, philosophical considerations on the whole were foreign to his mind. That is why I should prefer to call him a savant, or rather an enthusiast for learning, in the laudatory sense which the term once used to have. Artless, unfeigned love of knowledge, as it was the stimulus of his research, also pervaded his writing, teaching, and lecturing. It made every topic he happened to be concerned with come to life and unfailingly aroused and captivated the imagination as well as the interest of his audience.

Yet, in some way, Dr. Sigerist was a specialist after all. He professed, and was proud to profess, history of medicine. In the passage from which I quoted before, explaining why he finally chose this subject in preference to any other, he asserts: "Gradually I drifted into a field where I could combine all my interests, medical, philological, historical and sociological." Should one then say that under his leadership history of medicine was to provide a reconstruction of things past from as universal a point of view as is within the reach of the interpreter? I do not think that Dr. Sigerist ever found in his chosen field merely the most perfect satisfaction of his wish to know. "From the very beginning," he immediately adds in his self-appraisal, "I endeavored to correlate the history of medicine with the problems of our time." It may be that such a claim overemphasizes the consistency and consciousness of his intentions, fundamentally it is no doubt correct. The cross-connection of past and present was what he always aimed at, and thereby he gave to the study of the history of medicine an entirely novel significance and direction.

When Dr. Sigerist started out on his career, history of medicine had just passed the stage where it was no more than a hobby for retired practitioners. Largely through Sudhoff's efforts it had become recognized as a legitimate branch of historical investigation; it had been elevated to the rank of an academic subject in its own right. But even Sudhoff, whom

Dr. Sigerist admired as his one and only teacher in his calling, studied the history of medicine in order to understand rather than to judge. Although he admitted that what had happened in the past could sometimes serve as "a warning" for the present, he considered history of medicine on the whole a "theoretical" rather than an "applied" science, "eine Wissenschaft in sich selbst." Dr. Sigerist was intent on drawing lessons from his empathic analysis of historical events and situations. He tried to orient himself in the life of the present by the insight that he had gained from the past. The historian consequently felt obliged also to study contemporary medicine as it was practiced in this country, in Russia, in India, in South Africa, or in Canada.

Moreover, Sudhoff was prone to limit his investigations to individual problems. He shyed away from inquiries of a wider scope. Not that he was unaware of the necessity of posing general questions, of attempting even a universal history of medicine—his contention was that any such undertaking was still premature. He convinced himself and others that for a long time to come more detailed work would have to take precedence. Dr. Sigerist certainly delighted in solving minute problems; like Sudhoff he detested chance knowledge, "Zufallswissenschaft," that is, knowledge not based upon a systematic scrutiny of the facts. Nevertheless he aimed at generalizations. He was searching for the broad outlines of the development of medicine. From a relatively early point in his life, all his work was done in preparation for a comprehensive history of medicine which would lead the student from primitive beginnings through Eastern and Western antiquity on to the Middle Ages and the Renaissance and finally to his own time and place. Thus, and only thus, could the correlation between the history of medicine and the problems of the present be fully established.

The difference of Dr. Sigerist's approach from that of Sudhoff was due, of course, to a large extent to the difference in their intellectual endowment. While Sudhoff's mind was analytical, Dr. Sigerist's bent was toward synthesis. In general, one can hardly imagine a greater contrast than the one existing between these two personalities. Sudhoff, the Herr Geheimrat, was a typical academic, though in his younger years he had been practicing medicine. Dr. Sigerist, the least professorial of all professors, lived in the here and now, though all his life was spent in scholarly pursuits. However, what he made of the study of the history of medicine, what was his particular merit in contradistinction to that of his great predecessor, is not to be explained solely in terms of qualities of mind and temperament. Sudhoff's approach was that of the historical

school which came to predominate in Germany at the end of the nineteenth century and which in the ever-growing task of amassing the material for research gradually lost sight of the constructive aim of the historian. Dr. Sigerist's thought matured during and after the First World War. His were the dreams and ambitions of a generation wishing, as one of its favorite phrases had it, for bread rather than for stones.

There is one more characteristic of Dr. Sigerist's scholarship on which I should comment, one closely related to the traits I have dealt with so far, namely the obligation he felt as a scholar to take part in the current events. He was serious about bringing his knowledge to bear upon the issues of his own time and, with courage and determination, also faced his political responsibility. As a member of the University of Leipzig he firmly supported the democratic regime; he spoke out where others remained silent. He was happy to come to this country to escape to true freedom well before Hitler seized power, an event which he anticipated and regarded as inevitable. His opposition to fascism of whatever nationality was unswerving. When in the 1930's he began to be concerned with the "Russian experiment," he came to believe that communists and fascists differed, at least in their final aims, that the former looked toward a better future while the latter were but anxious to return to a dark past from which mankind had striven so hard to liberate itself. Interested as he was in the fight against disease, in the health of the population, in the improvement of physical conditions, he saw only the new hospitals and the modern research institutes, and what they might do for the people; he did not see, or did not want to see, the reign of terror, the brutal force on which this progress rested. In short, he fell victim to the illusion to which so many, and not the worst among the liberally minded, succumbed at that time. Those who disagreed with him then will be the first to remember the instances in which he was right in his political judgment rather than the one case in which he erred.

The influence Dr. Sigerist exercised on his contemporaries through the new impetus he gave to the study of medical history was great indeed. Nor will his work cease to have influence, I believe, on future generations, no matter how different their problems, their questions and answers, may turn out to be. His books, his articles are there to read and to derive profit from. But it is saddening to think that the full measure of what he could have given, has been withheld from ourselves as well as from those who will come afterwards. The history of medicine which was to be his crowning achievement was left unfinished. The hand which alone could have completed it was stayed all too soon.

It still is, and I suppose, it will always remain inconceivable that this life should have ended in a tragic manner. Throughout his early career and even in the years in Baltimore, Dr. Sigerist seemed like a favorite of the gods. Everything came easily to him. Success was with him, whatever he undertook. He went to Pura to be free of all obligations and diversions and to devote himself entirely to the one great task he had laid out for himself. Fate suddenly turned against him. The valiant effort, carried on even through the last excruciating years, proved to be in vain.

We mourn the loss of an outstanding scholar; we also deplore the loss of a true friend and a good companion. The graciousness and courteousness of his manner endeared him to everyone and knew no social distinction. He was at ease inside as well as outside the academic circle, with people of all walks of life, in the best democratic tradition of his homeland, Switzerland, to which he always remained most deeply attached. The charm and liveliness of his conversation made it a pleasure to talk to him. With an almost childlike delight in the small things of life he combined a sophisticated appreciation of the great. His optimism, his self-assurance, were an encouragement to others. Whenever help was needed, his generosity provided unstinted support. He did nothing half-heartedly. New ideas always fascinated him. He would not bear any grudge against those who dissented from him. What he wanted was that everyone should have the courage of his own convictions, just as he did.

To have been closely associated with Dr. Sigerist was for many years our good fortune. This experience we now treasure even more than we did before, and it will be with us, I know, beyond the fleeting hour that we dedicated today to commemorating him.

MAIMONIDES ON MEDICAL PRACTICE *

JOSHUA O. LEIBOWITZ

It is right to call Maimonides a universal scholar. His primary position is in theology, where he encompassed the whole of Hebrew law, both canonical and civil, as reflected in his authoritative *Code,* along with ethics and religious guidance, as exemplified by the letter addressed to the Jews of Yemen. He was an accomplished astronomer; in one of his letters he relates that he studied the whole literature on astronomy and astrology available in Arabic; in his letter to the Rabbis of Marseilles he condemned astrology as superstitious. He was the foremost Jewish philosopher, who strongly influenced Albert the Great and St. Thomas Aquinas, his magnum opus being the *Guide of the Perplexed,* translated in 1204 into Hebrew and in the first half of the thirteenth century into Latin.

To these great accomplishments Maimonides added medicine as vocation and profession, since he declined remuneration for his rabbinical duties.[1] In medicine he attained so high a distinction that Ibn Abi Usaibi'ah, the famous historian of Arabic medicine, wrote of him: "He was the leading man of his time in the art of healing." Actually, Maimonides began practising medicine only in 1167, at the age of 32, when, after the death of his brother, he was obliged to care for two families. As to his medical writings, they were completed in the last twenty years of his life, many of them in the form of *consilia* for the high ranking patients whom, as court physician, he treated. Despite the relative shortness of the period he devoted to more strictly medical writing, after he had finished his literary works on religion and philosophy, his output is remarkable and comprises ten medical treatises. Even his minor medical works preserve the formal structure of treatises and include the principles of medical practice, not just details pertaining to the special cases. Maimonides thus follows the admonition of Aristotle, his exalted master, who taught: "Plainly therefore in the science of Nature, as in other branches of study, our first task will be to try to determine what relates to its principles." [2]

* Read before the Johns Hopkins Medical History Club, February 18, 1957.

[1] See Maimonides' commentary on *Pirkeh abot* ("Sayings of the Fathers," a treatise of the Mishnah), ch. 4, 7.

[2] Aristotle, Physica I, 1; 184 a 14. *Works,* Translated into English under the editorship of W. D. Ross; Volume II, Physica, by R. P. Hardie and R. K. Gaye, Oxford, 1930.

Maimonides was aware of the heavy burden imposed upon him by his wide interests, and he complained, in a letter addressed to Rabbi Jonathan of Lunel, that his "heart has been divided into so many parts." The variety of his activities and the stress he laid on the principles of medical practice bring him close in personality to Sir William Osler, as Dr. Macht once aptly pointed out when addressing this Medical History Club in 1935.[3]

On the basis of the Hippocratic teaching that "nature is the physician of illnesses,"[4] Maimonides warns against the hyperactivity of doctors in treating minor diseases. Concerning this, there is a short passage at the end of his *Book on Asthma,* written about 1190, which is further elaborated in his *Regimen sanitatis,* written about 1199. The old Hebrew translation of the first book, by Samuel Benveniste (about 1302), was edited by S. Muntner,[5] while the Arabic original of the second, with a translation into German, was edited by H. Kroner.[6] The shorter quotation translated into English reads: "And sometmes a man will find a change in his digestion or he will experience some heaviness in his head, or some pain in one part of his body; in such cases be very careful and do refrain from treating these symptoms and from hurrying to use medicines." This is paralleled in the enlarged text of the *Regimen sanitatis* by: "In similar conditions nature is self sufficient and it is not necessary to support her by medication."[7] With these words Maimonides expressed Hippocrates' general rule in an elegant form and, by naming a few examples, he integrated the principle into the routine of medical practice. He refers to speed and hurry in taking medicines, a misuse met with in our days also. Maimonides, in this context, deals with the danger in therapeutics and thus with the application of a principle which would preclude drug reactions and even drug fatalities, to use modern terms, in harmless cases. Parenthetically "rashness" on the side of a physician, according to classical medicine, often betrays "helplessness" and "want of knowledge."[8] In the

[3] D. Macht, "Moses Maimonides, physician and scientist," *Bull. Hist. Med.*, 1935, *3*: 585-592.

[4] Hippocrates, *Epidemics,* book VI, section V, 1.

[5] Maimonides, *The Book on Asthma,* Hebrew translaton by Samuel Benveniste, published for the first time, with commentary and explanatory notes, by Süssmann Muntner, Jerusalem, Rubin Mass, 1940.

[6] H. Kroner, "Fī tadbīr aṣ-ṣiḥḥat, Gesundheitsanleitung des Maimonides für den Sultan al-Malik al-Afḍal. Zum ersten Male im Urtexte herausgegeben, ins Deutsche übertragen und kritisch erläutert." *Janus,* 1923-27, *27*: 101-116, 286-300; *28,* 61-74, 143-152, 199-217, 455-472; *29,* 235-250.

[7] *Ibid., Janus,* 1924, *28*: 458.

[8] Hippocrates, *Law,* ch. 4; see L. Edelstein, "The professional ethics of the Greek physician" (*Bull. Hist. Med.,* 1956, *30*: 391-419), p. 404.

Hippocratic *Law*, "rashness" is named along with "cowardice"; since rash hyperactivity may also betray the lack of courage, when the unskilled doctor feels himself impelled to do something in fear of coming disaster.

On the other hand, Maimonides advocates prompt action in diseases that require such an approach. Let us call it a selective activity. In the same chapter of his treatise on asthma he postulates: "The physician has to find out which are the diseases requiring prompt assault and control, and discern diseases in which no action at all is indicated and in which he shall at first rely on the working of nature."

The doctrine of the healing power of nature was initiated by Hippocrates as a general principle, and was not supported by elaborated clinical observations. It was strongly opposed by Asclepiades.[9] Then it was raised by Galen, on Hippocrates' authority, to a high place in therapeutics.[10] However, Galen's zeal for supporting Nature in her healing tendencies practically led to the destruction of the doctrine and to a grotesque polypharmacy [11] which persisted throughout the Middle Ages. The essential point of the doctrine, however, was sound. It presupposed an active reaction of the organism to the disease, so that Isaac Judaeus in the tenth century could speak of a "duel between nature and the disease," and a similar conception was shared by Avicenna.[12]

In the nineteenth century the doctrine was revived by Jacob Bigelow of Boston.[13] "It was he who made the first effective protest in America against ill-chosen drugs and large doses, and against excessive bloodletting. He embodied in his *Discourse on Self-limited Diseases* (1835) the idea that many disorders if left to the natural recuperative powers of the patient would disappear more rapidly than from excessive medical treatment. Of this lecture Dr. Oliver Wendell Holmes (*Proceedings of the American Academy of Arts and Sciences*, 1879, p. 16) said that it exerted more influence upon medical practice in America than any work that had ever been published in this country."[14] Coined by the great Bostonian in spiritual kinship with the sage of Fostat, the term "self-limited disease"

[9] Caelius Aurelianus, *De morbis acutis* I, ch. 14.

[10] Galen, *Opera omnia*, ed. Kühn (Leipzig, 1821-1833), vol. 15, p. 309, and vol. 16, p. 35.

[11] M. Neuburger, *Die Lehre von der Heilkraft der Natur im Wandel der Zeiten*, Stuttgart, 1926.

[12] Avicenna, *Canon*, lib. IV, fen 1, tract. 1, c. 3.

[13] J. Bigelow, *Discourse on Self-limited Diseases*, Boston, 1835. Also in *Med. Communicat. Mass. Med. Soc.*, 1836, 319-358.

[14] *Dictionary of American Biography*, *s.v.* "Bigelow, Jacob," vol. 2, New York, Scribner's, 1929, p. 258. Since the article in the *Proceedings* cited by the authors is not signed, Holmes' authorship rests on the assurance of Bigelow's biographers. Moreover, the article occurs on p. 336 of the *Proceedings* and not on p. 16 as stated.

became a common expression. It is worthy of note that Maimonides brought a biological principle so near to the practice of medicine. How often this principle was violated during the Middle Ages is clear from the practice of surgery, when wounds were systematically infected artificially and healing by prime intention neglected, till the reform of wound treatment by Paré.

We proceed with another quotation from the *Book on Asthma,* which is paralleled in more detail in the *Regimen sanitatis*:[18] "The dangers are obvious to the wise while the fools do not find anything difficult. How easy is healing in the eyes of the sons of our art, and how long and deep it had been in the eyes of Hippocrates ['ars longa']. Behold: inasmuch as a man be perfect in this wisdom, new doubts arise in him which lead to additional contemplation. But inasmuch as he is bare of knowledge, each difficulty is easy in his eyes, he exceeds in follies and in the rashness of answering to what he does not understand." Here again Maimonides finds an epigrammatic formula for the old truth in the practice of medicine and he bases his truth on the authority of Hippocrates, Galen, and al-Razi.[19]

However, this quotation contains much more than emphasis on dangers met with and responsibilities involved in medical art. We breathe fresh air when we read again the following part of the quotation: ". . . new doubts arise which lead to additional contemplation." In an authority-bound world, Maimonides' words herald the advent of a new wisdom. Doubts were indeed the greatest stimulation in the process of his creative mind. In his *Aphorisms,* largely built on Galen, Maimonides did not hesitate to criticize his hero. In Biblical exegetics Maimonides attempted a moderately allegorical approach to the explanation of wonders and the elimination of anthropomorphous references to God. In his *Code* he managed to change the whole Talmudic arrangement of law material and to transform it into his own systematic order. Whatever "doubts" were indicated, revision took place. Maimonides' remark of "doubts leading to additional contemplation" is a landmark not only in medical practice but in the history of ideas as well.

Maimonides' approach to medicine was positive and constructive. He was far from a "therapeutical nihilism" as represented by the Viennese school of the mid-nineteenth century. In criticizing over-zealous physicians he followed Hippocrates and Galen, but he is more specific in presenting examples and in paying more attention to social and environmental conditions. Maimonides keeps the position of a teacher and leader in accord-

[18] *Regimen sanitatis,* IV, 8, *op. cit.* (see note 6), pp. 461-464.
[19] *Ibid.,* p. 462.

ance with his standing in the sphere of religion. In the same manner that he tried to correct spiritual conditions in his *Guide of the Perplexed,* or the arrangement of law material in his *Code,* he also pointed out in his medical writings the shortcomings in the approach to medical practice of his time. However, his appreciation of medicine at large is great and unlimited. In the *Book on Asthma* he writes: "Be cognizant of [the fact] that medicine is a very essential wisdom for man at any time and at any place. Not only during illness but even so in full health, and it comes close to me to say that nobody may detach himself from medicine forever. This is valid as long as the physician has attained perfection to the possible limit, to him shall one deliver one's body and soul to be guided by his advice."

Even more positive is Maimonides in his *Code,* "Rules of Opinions," chapter 4. After enumerating his rules of health he promises the reader who will follow them: "I give him a guaranty that he will not contract an illness all his days till he gets old and dies, and he will not need a physician, and his body will be perfect and faultless all his days. This on the condition that his body was not imperfect from birth, that he has not adopted bad conduct from childhood, and that there did not come a disaster of plague or dryness upon the world." It appears that Maimonides must have included cardiovascular incidents and malignancy in a concept of innate imperfection or external noxious agents. At any rate, this overbold and unlimited assertion shows Maimonides' high esteem of medical rules, and contrasts with his generally cautious and weighted manner. His rules contain also elements of preventive medicine. Besides, his treatise *On Poisons* was composed at the request of the vizer Al-Fadil for the treatment of cases of poisoning by venomous animals before the arrival of the physician or until the patient might reach the dispensary where the theriacs were kept. This belongs not so much to prevention proper as to medical preparedness, of which Maimonides was an ardent supporter.[17]

It is an old truth in medical practice, already expressed in Hippocrates' first aphorism, that the physician must "also make the patient, the attendants, and the externals cooperate" (translation by Francis Adams). Accordingly, Maimonides directs to the public a few critical remarks which are not of a flattering kind.

In the *Book on Asthma,* after his eulogy of the perfect physician to whom people should apply, he declares: "However, people do not do so, and they seek medical help from anyone whom they may meet by chance

[17] See the preface to his treatise *On Poisons.*

and from everything which seems new." Then he proceeds in a lighter vein:

> I saw things practised in the land of Egypt by the noble as well as by the populace, for seldom is a physician called to treat a patient from the beginning of his illness till its end; rather they wander from one physician to another. Sometimes the patient is being attended by ten physicians according to his means, without one knowing of the other. The patient then takes the advice of each of the doctors, makes his decision, and chooses what he finds good by his own judgment. This practice has disadvantages to which I shall call your attention. First, the perplexity of the patient himself who does not know with whom the truth lies. Second, the perplexity of the physician; because, if he could attend the case from beginning to end, then seeing success he would continue his way of treatment, while seeing the contrary he would take another way. Third, the damage to the physicians when every one of them criticizes his fellow physician and imputes errors to him. And fourth, the inertness of the physician and the weakness of his thought, and his dependence on the others; and his knowing that if he erred the error will not be attached to his name alone; and if he were on the right way, he would not be the only one to be credited with the success. Therefore he will not strive to proceed as he should according to his opinion, knowing that nobody relies on him alone.

The passage just quoted is not devoid of humor and touches upon environmental conditions, while the arrangement of the arguments betrays the philosophical mind of the author.

The scope of the present paper, dealing with Maimonides' approach to medical practice, precludes a detailed presentation of his views on particular disciplines or diseases. These are contained in special treatises and also systematically arranged, along with chapters on anatomy, dietetics, balneology, sports, and so on, in Maimonides' *Aphorisms*. Unfortunately, no translation of this book into a living European language has as yet been published. Students sufficiently acquainted with Latin may use the old Latin translation [18] which, compared with the two printed Hebrew versions, has the advantage of being provided with frequent references to parallel statements in Galen's works. However, an exception will be made in this paper with regard to two items, surgery and psychosomatics, both of which depict Maimonides' general views.

The *Aphorisms* are subdivided into twenty-five chapters which the author calls books (*māqalāt*), while he reserves the term chapter for the individual aphorism. Book (or in Latin, *particula*) 15 is called: "Aphorisms pertaining to surgery." Maimonides describes some minor operations such as those for rectal fistula, paracentesis in ascites, extirpation of

[18] Maimonides, *Aphorismi Rabÿ Moyses secundum doctrinam Galeni*, Bologna, 1489, pp. 131 ff.; other Latin editions: Venice, 1508; Basel, 1579.

varicose veins, varicocele, and nasal polyps. In discussing surgical intervention for cancer he adds: "Cut out the whole of the growth till you reach a healthy place." It is refreshing to find a discussion of the ligature of the blood vessel for hemorrhage along with the technique of the procedure. This seems remarkable when we consider the low level of Arabic surgery in Maimonides' times, some hundred years after the great surgeon Abulqasim, whose work was forgotten in the Orient and only later revived through the Latin translation. It is very probable that Galen [19] was the source for Maimonides, though ligature had been mentioned even earlier by Celsus,[20] Soranus,[21] Archigenes, and Rufus.[22] Then the procedure was abandoned and several times rediscovered—also briefly mentioned by Abulqasim—till its final adoption by Ambroise Paré, with such prospective improvement of his crude technique as the future held.

What asociates the chapter on surgery so closely with this study is Maimonides' philosophical explanation of the surgical indication. The text of the quotation which follows has been found to be essentially the same in the Arabic original,[23] the Hebrew, and the Latin versions, and can be translated into English in the following manner:

> When you think of cutting out something of the body, keep in mind three intentions. The first, that your work shall be finished in the shortest time possible; the second, that no pain at all shall be caused; the third, that you be sure of the result. However, the result will require three intentions. First, be clearly aware that your intentions will be attained with certainty; second, if this cannot be achieved, at least no damage shall ensue from side effects; third, be sure that the disease shall not relapse. Then when you consider these intentions it will be evident to you that at times surgical and at times medicinal treatment will be more praiseworthy.

When detached from scholastic systematization these words betray Maimonides' wisdom in the general approach to surgical operations. The goal to be achieved must be outlined with reasonable clarity, detrimental side effects anticipated, and the possibility of a relapse kept in mind. Before making his decision, the surgeon is summoned to consider scientifically what can be gained for the patient by the intervention and be aware of incidental damage by side effects.

Historically it seems important to know that a subdivision on surgery

[19] Galen, ed. Kühn, vol. 10, pp. 317-319.
[20] E. Gurlt, *Geschichte der Chirurgie*, 3 vols., Berlin, 1898; vol. 1, pp. 354 and 366.
[21] O. Temkin, *Soranus' Gynecology*, translated with an introduction, Baltimore, 1956, p. 162.
[22] Gurlt, *op. cit.*, pp. 412 and 428.
[23] Courtesy of Dr. Pines of the Hebrew University.

is included in Maimondes' *Aphorisms,* which offers some material on the history of Arabic surgery along with the more detailed chapters in Razi's Seventh Book, *Ad Almansorem,* and Abulqasim's medical encyclopedia, *Al-Taṣrīf.*[24] Further, it is relevant to learn that some kind of anesthesia must have been applied in Maimonides' time, since it had already been practised preoperatively ("drug of sleep") in the Talmudic period and had been suggested by Dioscorides.

The *Regimen sanitatis* contains some of Maimonides' general rules of medical practice; they were quoted above according to the shorter and more aphoristic text chosen by Maimonides at the end of his *Book on Asthma.* The most characteristic feature of the *Regimen* is the third chapter dealing with the soul's influence on the body and the rules derived therefrom for the physician's approach to practice. The influence of emotions on some physical conditions, such as facial color and secretions, had been very briefly alluded to in the Hippocratic writings.[25] Galen, in his commentary on Hippocrates' *On Humors* (ch. 9)[26] described the "pulse of love," and also presented a case in which emotional disorders had been betrayed by changes in the pulse.[27] Further allusions to psychosomatics are to be found in various Galenic writings.[28] A few cases of crude psychotherapy are to be found in the writings of Razi and Ibn-Sina. However, Maimonides was the first medieval author to pay very great attention to the psychic factor in the theory and practice of medicine. When in the *Regimen* he says that the "control of emotions may be achieved by philosophy and the morals of religion," his psychotherapy is more along the lines of a kind of sublimation. His ethical and philosophical training may thus help the patient to overcome emotional disorders. Besides, says the author, "the good of this world and its evils are imaginary goods and evils." "In this way the passions diminish, the bad thoughts disappear, unsociableness is removed, and the soul is gladdened in spite of all the things which may happen to a man." Maimonides' conception of the passions reminds us of the *Ethics* of Spinoza, despite the difference of their personalities, and even of the famous address by Sir William Osler, *Aequanimitas,* of 1889.

[24] L. Leclerc, *La chirurgie d'Abulcasis,* Paris, 1861.

[25] Hippocrates, *Epidemics,* book II, section IV, 4; book V, section V, 5.

[26] Galen, ed. Kühn, vol. 16, p. 310.

[27] *De praenotione ad Posthumum,* ch. 6; ed. Kühn, vol. 14, pp. 630-635. English translation in: Arthur J. Brock, *Greek Medicine,* 1929, New York, pp. 212-214. The scene is depicted in one of the illustrations surrounding the title page of Galen's Latin works, Junta edition, Venice, 1550.

[28] For instance in: *De methodo medendi,* 12, ch. 5; ed. Kühn, vol. 10, pp. 841-845.

The *Regimen sanitatis* was directed, about 1190, to the Sultan Al-Afḍal, who complained to his physician, Maimonides, of fits of melancholy, constipation, and digestive disorders. In answering the questions of the monarch, the author embarks on a discourse on psychosomatics.[29] "It is known to my lord that the emotions of the soul involve great changes of the body [functions] which are generally evident and testified to. You see a man, strong bodied, with full sounding voice and bright colored face. When he is suddenly hit by very afflicting news, his complexion immediately becomes pale, the glow of his face vanishes, his body is bent, his voice weak, his strength gone; he will even often tremble, his pulse becomes smaller and his eyeballs sunk . . . ; the surface of his body gets cold, and his appetite disappears. The reason for all these signs is the withdrawal of the innate heat and of the blood into the inner parts of the body."

Here the author considers the disorders described as a test for his assertion of bodily reactions to emotions. He pictures a shock-like syndrome remindful of vasomotor failure.

From this Maimonides proceeds to the practical consequences of his theory of psychodynamics and declares emphatically: "Therefore it is the physicians' order to keep in sight the movements of the soul, to study them constantly, and to try to bring them into balance in health as well as in disease. . . . It is the first principle in the treatment of every patient, and especially in psychic diseases. . . . The competent physician shall do nothing before improving the state of the soul by alleviating the emotions." It appears that Maimonides advocated a psychological approach even to organic diseases.

The last quotation to be presented is from the very end of the *Book on Asthma*. Its subject is the philosophy and the causes of error. The first three points Maimonides took from Alexander of Aphrodisias, the peripatetic philosopher of the beginning of the third century A. D., best known for his commentaries on Aristotle. The fourth point was added by Maimonides himself. These are the causes of error:

(1) Love of contradiction and opposition which hinders people from conceiving a thing as it is in reality; (2) profundity of the thing to be conceived, its sublety, its power, and the difficulty to conceive it; (3) foolishness of the conceiver and his disability to apprehend what is quite within the powers of conception; (4) and the fourth cause is routinsim, since people adhere by nature to their habits, incline to them and detest any other opinion, even if it be nearer to the truth.

Maimonides' objection to routinism and of too strict an adherence to traditional habits concludes his general views on sound and perfect practice of medicine.

[29] *Op. Cit.* (see note 6), p. 414 ff.

COMMENTS ON SAMUEL JOHNSON'S BIOGRAPHY OF SIR THOMAS BROWNE

MARY FRANCES WAGLEY and PHILIP F. WAGLEY

Few periods of English history have produced as extreme changes in thought and opinion as those appearing in the early seventeenth century (1-4). The word "incongruous" characterizes the thinking of that era. A surge of inquisitiveness aroused child-like enthusiasm in minds previously nurtured by deductions from ancient writings. Medieval mysticism distorted the sprouts of scientific thought. Astrology mingled with astronomy, alchemy with chemistry, and witchcraft with medicine. Members of that circle of intellects at Gresham who later associated themselves more formally as the Royal Society seriously weighed the pros and cons of inaccurate and absurd reports. Church and state were caught in a turbulent stream of skepticism. Anglicans, Puritans, Cromwellians, Catholics, Royalists, Levellers, and other groups rallied the populace to their support. Protestantism had become a centrifugal influence. Its encouragement of inductive reasoning led to an individualism expressed in numerous tracts on a myriad of subjects from "Country Contentment" to "Amsterdamnable opinions" (2). No period of English literature produced more non-Rabelaisian "curiosa."

One of the more brilliant examples of the spirit of the era was Sir Thomas Browne. Physician, antiquarian, scientist, philosopher, mystic, encyclopedist, and author intermingled in one person. Though prominent in his time and a correspondent with many intellectuals, relatively little is known about his personal life (3). A few letters and records (5), an occasional reference to his activities in his published work and a brief note by his friend Whitefoot (6) form the bulk of biographical information. This retirement from public gaze, the apparent shyness in expressing opinions about and taking a bold stand in public affairs may have resulted partially from an attitude shared with and expressed by John Selden (1584-1654): "The wisest way for a man in these times is to say nothing" (2). In contrast to this dearth of intimate knowledge there are extensive publications by Browne on his readings and study in a broad range of subjects (5, 6, 7). Though their contents now have limited value, the style of his writings influenced markedly that of later English literature. Coleridge called it "delicious" and "often truly great and

magnificent in . . . diction" (8). Lytton Strachey ascribed a strong formulating influence on the style of Samuel Johnson through the latter's study of the writings of Sir Thomas (9). Hill (10) emphasized that "the observation of his (Johnson) having imitated Sir Thomas Browne has been made by many people." Thus, it is of multiple interest that Samuel Johnson thought it worth his effort to append a brief *Life* to the second edition of *Christian Morals* published in 1756, over seventy years after Browne's death. *Christian Morals* had appeared first posthumously in 1716. Johnson's sketch of Browne's life was added to the next edition forty years later. The biography is quite short and borrows heavily from Whitefoot's prospectus for an unpublished book (6). Though the *Life* lacks much in facts about Browne, it is replete with the opinions of Johnson written in his inimitable and frequently amusing phraseology. In Boswell's opinion (10) it "is one of Johnson's best biographical performances."

Browne was born in the parish of St. Michael in Cheapside, London, on the nineteenth of October, 1605. Johnson did not know the names of any distaff ancestors, not even the mother's maiden name (Anne Garraway) (6). Although the early loss of his father and remarriage of his mother left him, in Johnson's opinion, "helpless and unprotected" the young heir received actually a considerable fortune and had the later advantages of an excellent education at Winchester and Oxford (3). Finch (4) has pointed out that "Johnson obviously exaggerated" the financial problems in Browne's youth. Following graduation from the then recently created Pembroke College in 1627, he studied and practiced "physick." After a brief sojourn in Oxfordshire there was a period of travel the dates of which are not definitely known. Reflecting his own attitude and disinclination to travel, Johnson observed: "He that has once prevailed on himself to break his conexions[1] of acquaintance and begin a wandering life very easily continues it." Apparently piqued by the physician's reticence and vagueness in recounting his travel experiences in Ireland, France, and Italy, he continued,

> It is, however, to be lamented, that those who are most capable of improving mankind, very frequently neglect to communicate their knowledge, either because it is more pleasing to gather ideas than to impart them or because to minds naturally great, few things appear of so much importance as to deserve the notice of the publick.

Browne returned from his travels before or in 1634. During this period

[1] See footnote 2.

he wrote *Religio Medici*. Exactly where and when it was written is debatable. Presumably the manuscript was finished by 1635 and was circulated among friends for seven years or so. Though such a disposal of written material would be most unusual today it was not an uncommon practice then (2). For example Florio's translation of Montaigne's essays circulated in manuscript before publication in 1603 and Hobbes' *Elements of Law, Natural and Politic* circulated for ten years in manuscript before publication in 1650.

Of Browne's letter to Sir Kenelm Digby (6), denying any original intent of publication of this work, Johnson comments

> but when it was written, it happened to him as to others, he was too much pleased with his performance not to think that it might please others as much; he therefore, communicated it to his friends, and receiving, I suppose, that exhuberant applause with which every man repays the grant of perusing a manuscript, he was not very diligent to obstruct his own praise by recalling his papers, but suffered them to wander from hand to hand, till at last, without his consent they were in 1642 given to a printer.

Browne's protestation of ignorance about the first publication of his work was in defense against several derogatory comments by Sir Kenelm Digby. Of such criticism, Johnson observes, " What is much read, will be much criticized " and apropos of the later " gentle and respectful " correspondence between Browne and Sir Kenelm he remarks: " The reciprocal civility of authors is one of the most risible scenes in the farce of life."

Johnson doubted Browne's statement that " to relate (my life) were not history but a piece of poetry and would sound like a fable " because in his (Johnson's) own opinion " a scholastic and academical life is very uniform and has, indeed, more safety than pleasure." Johnson goes on to say:

> The wonders probably transacted in his own mind: self-love, cooperating with an imagination vigorous and fertile as that of Browne, will find or make objects of astonishment in every man's life: and perhaps, there is no human being, however hid in the crowd from the observation of his fellow-mortals, who, if he has leisure and disposition to recollect his own thoughts and actions, will not conclude his life in some sort a miracle, and imagine himself distinguished from all the rest of his species by many discriminations of nature or of fortune.

After citing from Browne's *Religio Medici* " the whole world was made for man, but only the twelfth part of man for woman " and " man is the whole world, but woman only the rib or crooked part of man," Johnson amusedly and cynically speculates on the motives of Dorothy Mileham in accepting Browne's proposal of marriage. " Whether the lady had been

CHRISTIAN
MORALS:

BY

Sir THOMAS BROWNE,

Of NORWICH, M. D.

AND AUTHOR OF

RELIGIO MEDICI.

THE SECOND EDITION.

WITH

A LIFE OF THE AUTHOR,

BY

SAMUEL JOHNSON;

AND

EXPLANATORY NOTES.

LONDON:

Printed by RICHARD HETT,

For J. PAYNE, at POPE's HEAD, in PATER-NOSTER ROW.

M DCC LVI.

FIG. 1. A reproduction of the frontispiece from an original of the second edition of *Christian Morals* to which had been added, for the first time, the biography by Samuel Johnson.

informed of these contemptuous positions or whether she was pleased with the conquest of so formidable a rebel and considered it as a double triumph to attract so much merit, and overcome so powerful prejudices, or whether like most others, she married upon mingled motives, between convenience and inclination, she had, however, no reason to repent." Although Browne had wished in his younger years "we could procreate like trees without conjunction" he submitted to his new role in life and ten children entered the family circle. Judging from the thoughtful letters in later years to his two sons, Edward and Thomas, he was a devoted father (5). Footnotes to such correspondence in the hand of his wife reveal a shared and deep family love.

Johnson was sufficiently impressed with the breadth of knowledge displayed in *Pseudodoxia Epidemica*[2] to conclude: "He appears, indeed, to have been willing to pay labour for truth." But his admiration is limited by the realization that "notwithstanding his zeal to detect old errors, he seems not very easy to admit new positions, for he never mentions the motion of the earth but with contempt and ridicule, though the opinion which admits it, was then growing popular, and was, surely, plausible, even before it was confirmed by later observations." Later he adds the reservation that "like other men of multiferous learning he received some notions without examination." What Johnson perceived may have been detected by contemporaries of Browne for he was never included in that intellectual circle of the Royal Society. A comparison of his mode of thought with that of other physicians such as William Gilbert (1540-1603), William Harvey (1578-1657), William Petty (1623-1687), Richard Lower (1631-1691), or Thomas Sydenham (1624-1689) emphasizes the antiquarian and mystic shades of Sir Thomas' ideas. His observations on a dead whale, or a badger, or weights of birds were pursued casually and more by accident, one concludes, than by design. Not only were Sir Thomas' interests more medieval than modern but so were his premises of analysis and syncytium of thought. Even in his own day English minds of comparable resources had passed him by.

Johnson's lack of appreciation for the antiquarian is reflected in his brief reference to *Hydriotaphia, Urne-Buriall.*

> It is, indeed, like other treatises of antiquity, rather for curiosity than use, for it is of small importance to know which nation burned their dead in the ground, which threw them into the sea, or which gave them to birds and beasts; when the

[2] The spelling and punctuation by Samuel Johnson is adhered to in the direct quotations. The titles are spelled according to the *Columbia Encyclopedia*, second edition.

practice of cremation began, or when it was disused; whether the bones of different persons were mingled in the same urn; what oblations were thrown into the pyre, or how the ashes of the body were distinguished from those of other substances.

Johnson confines his remarks on *The Garden of Cyrus* to a very brief outline of the subject matter and gives what he considers the reason for Browne's expending so much time and energy on these studies.

> Some of the most pleasing performances have been produced by learning and genius exercised upon subjects of little importance. It seems to have been in all ages, the pride of wit, to show how it could exalt the low, and amplify the little. To speak not inadequately of things really and naturally great, is a talk not only difficult but disagreeable; because the writer is degraded in his own eyes by standing in comparison with his subject, to which he can hope to add nothing from his imagination; but it is a perpetual triumph to fancy to expand a scanty, to raise glittering ideas from obscure properties, and to produce to the world an object of wonder to which nature had contributed little. To this ambition, perhaps, we owe the Frogs of Homer, the Gnat and Bees of Virgil, the Butterfly of Spencer, the Shadow of Worrerus and the Quincunx of Browne.

Although Johnson summarizes his reaction to *Hydriotaphia, Urne-Buriall* as "the uselessness of all these inquires" he concludes that the Quincunxial considerations substantiate his impression that "the fanciful sports of great minds are never without some advantage to knowledge."

In quoting Whitefoot extensively, Johnson emphasizes the importance of biographical data furnished by an intimate friend because

> of every great and eminent character, part breaks forth into publick view and part lies hid in domestick privacy. Those qualities which have been exerted in any known and lasting performances, may, at any distance of time, be traced and estimated, but silent excellencies are soon forgotten, and those minute peculiarities which discriminate every man from all others, if they are not recorded by those whom personal knowledge enabled to observe them, are irrecoverably lost.

Furthermore, although "the opinions of every man must be learned from himself: concerning his practice, it is safest to trust the evidence of others." However, he adds

> it is not on the praises of others, but on his own writings that he is to depend for the esteem of posterity; of which he will not easily be deprived, while learning shall have any reverence among men: for there is no science, in which he does not discover some skill; and scarce any kind of knowledge, profane or sacred, abstruse or elegant, which he does not appear to have cultivated with success.

It is of interest that Johnson omits any mention of Sir Thomas Browne's appearance for the prosecution of two witches is 1664. This

occasion has been a source of tribulation for Browne's admirers in later generations but actually should not be for two reasons. First, there is some question as to how decisive a role the physician played in the trial. His remarks before the judge, Sir Matthew Hale, were rather obliquely presented. He expressed no opinions about the guilt of the accused though he thought the children involved had been bewitched. Secondly, his actions and comments must be judged in the context of the times. The last English judicial execution for witchcraft was still forty-eight years away (1712) and in Scotland fifty-eight years in the offing. The English laws against sorcery were not repealed until 1736. Nor can we forget that the last decade of the seventeenth century in Massachusetts was to be filled with savage persecution of witches—activities applauded by the English Puritan, Richard Baxter, who, incidentally, was a close friend of Sir Matthew Hale, the presiding judge at the above trial (3). Thus, one might assume the judge was biased in such matters himself and any decision of guilt could not be ascribable simply to the remarks of Browne.

In the light of Lytton Strachey's (3) and Hill's (10) conclusions that Johnson's style had been strongly influenced by study of Browne's writings it is particularly interesting to read the eighteenth centuries' literary arbiter's comments on Sir Thomas' own style. "It is vigorous, but rugged; it is learned, but pedantick; it is deep but obscure; it strikes, but does not please; it commands, but does not allure; his tropes are harsh and his combinations uncouth." Johnson, however, liked the "verva ardentia . . . which he would never have found but by venturing to the utmost verge of propriety" and concludes "in defence of his uncommon words and expression, we must consider that he had uncommon sentiments, and was not content to express in many words that idea for which any language could supply a single term." Presumably it was the choice of words and not so much their arrangement that the venerable lexicographer liked most. Though Coleridge (8) marked many sentences and passages by Browne as showing "majesty," "sublimity," "brilliance," or "ingenuity" in conception or style, he characterized others as "quaint." He spoke of the style as being often "big, stiff, and hyperlatinistic." Such praises seem more impressive and the aspersions insignificant when we recall that only in the preceding century was English newly accepted as a kind of official language. Earlier scholars wrote Latin and since the Conquest the court had used French (11). Apparently Browne's was one of the great patterns for later English styles though he may have injured literary taste with his frequent use of learned words.

The deeply religious Johnson devotes the last few paragraphs of his brief biography to a defense of charges against the orthodoxy of Browne's Christian beliefs. Though he doesn't make it clear why such a defense is necessary, a student of Sir Thomas Browne need not look far to find at least four reasons why some questioned his religious status. First, Browne frequently speculated about Biblical statements in a manner implying a latent skepticism. He asked how the animals of the Ark spread from Mount Ararat to all the continents. He doubted one miracle of Moses' time if manna were an actual plant then flourishing in Arabia. Secondly, he obviously was not convinced that martyrdom for Christian principles (as interpreted by the individual) was to be admired unreservedly. Thirdly, he did not participate in the vigorous religious debates of his time. Fourthly, he confessed to three "heresies" in his youth: (1) The soul died with the body and would be resurrected; (2) God would not persist in his vengeance, and (3) prayers for the dead were admissible. Probably relatively few present-day avowed Christians ever think about such matters or would detect heresy in any of these propositions. Although no comprehensive analysis of *Religio Medici* is given by Johnson a broad grouping of its contents does seem admissible. Faith and hope are the dominant themes of the first sections and play a minor role only to that of charity in the latter portions. Thus, faith, hope, and charity intermingled with asides of frank opinions, doubts, confessions, and aspirations compose this credo of a great physician. And so it seems correct for Johnson to conclude that "Browne was a zealous adherent to the faith of Christ, that he lived in obedience to his laws and died in confidence of his mercy."

BIBLIOGRAPHY

(1) Willey, Basil. *The Seventeenth Century Background.* Chatto and Windus, London, 1934.

(2) Bush, Douglas. *English Literature in the Earlier Seventeenth Century.* Clarendon Press, Oxford, 1948.

(3) Dunn, William P. *Sir Thomas Browne. A Study in Religious Philosophy.* University of Minnesota Press, Minneapolis, 1950.

(4) Finch, Jeremiah S. *Sir Thomas Browne: A Doctor's Life of Science and Faith.* Henry Schuman, New York, 1950.

(5) Keynes, Geoffrey. *The Letters of Sir Thomas Browne.* Faber and Faber, London, 1946.

(6) Wilkin, Simon. *Sir Thomas Browne's Works.* William Pickering, London, 1836.

(7) Keynes, Geoffrey. *The Miscellaneous Writings of Sir Thomas Browne.* Faber and Faber, London, 1946.

(8) Brinkley, R. F. *Coleridge on the Seventeenth Century.* Duke University Press, Durham, 1955.

(9) Strachey, Lytton. *Books and Characters, French and English.* Harcourt, Brace and Co., New York, 1922.

(10) Hill, G. B. *Boswell's Life of Samuel Johnson.* Clarendon Press, Oxford, 1887.

(11) Fairbrother, Nan. *Men and Gardens.* Alfred A. Knopf, New York, 1956.

THE RHEOTOME AND ITS PREHISTORY: A STUDY IN THE HISTORICAL INTERRELATION OF ELECTRO-PHYSIOLOGY AND ELECTROMECHANICS

H. E. HOFF AND L. A. GEDDES

(Concluded)

THE RHEOTOME

Du Bois-Reymond himself made a start on working out the questions he had raised regarding the time and intensity curve of the negative variation, through the necessity of separating shock artifacts from the negative variation itself in his early studies. To this purpose he constructed a two-position switch operated by a rocker arm, by which in one position the connections of the nerve to the galvanometer were broken and a stimulus delivered, while in the opposite position the stimulating circuit was interrupted and the nerve reconnected to the galvanometer. Between these two extremes, both circuits were disconnected. The rocker-arm was activated by a pusher-rod riding on a cam operated by clock-work, so constructed that with each revolution a cycle of stimulation and registration was carried out. By varying the shape of the cam, the duration of the stimulus and the subsequent interval of time before the galvanometer was reconnected could be varied independently (Figure 2).

The principle of such an arrangement dates from almost the earliest days of induction electricity when physicists faced the necessity of analysing the alternating current wave. Saxton,[27] an American living at the time in London, is generally credited with the first construction of a rotating-coil instrument to generate electricity (32). His machine consisted of three coils affixed to a shaft so as to rotate past the poles of a strong horseshoe magnet. Contact with the coils was made through cups of mercury into which dipped disks of metal affixed to the shaft and connected to the coils (33). It was of course soon apparent that this

[27] *Saxton, Joseph (1799-1873).* A practical mechanical genius who began life as a clockmaker in Philadelphia, where he constructed the clock for the belfry of Independence Hall. Living in England between 1828 and 1837, he made the magneto-electric machine described here, very likely through association with Faraday. He returned to this country to become Curator and Constructor of the standard weighing apparatus at the U. S. Mint, and was later (1843-1873) Superintendent of Weights and Measures for the U. S. Coast Guard Survey in Washington, D. C.

apparatus produced alternating current, which was inappropriate for many applications; and Page,[28] another American, devised the segment commutator which is still in use (34). He made early use of the device in the construction of a galvanometer that could revolve throughout a full 360

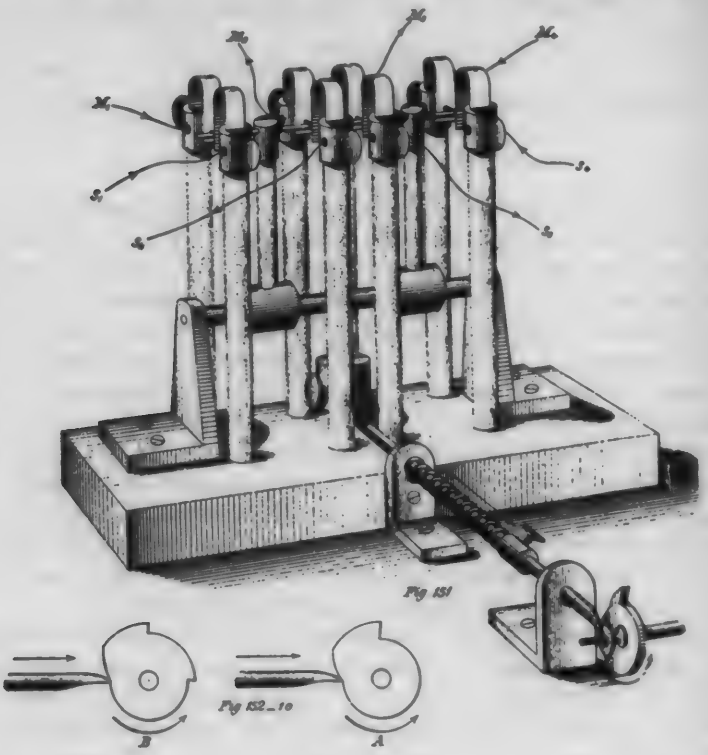


FIGURE 2.

Du Bois-Reymond's Rheotome. From ref. 20, vol. II, Pt. 2, Pl. 6, Fig. 151.

[28] *Page, Charles Grafton (1812-1868).* Son of a sea captain of Salem, a graduate of Harvard College, and trained in medicine, he turned to electrical experimentation soon after starting practice and retained this interest throughout his life. He is responsible for devising a prototype of the modern induction coil, for the discovery of the influence of substituting a bundle of iron wires for the core of solid iron in the induction coil, and for the self-acting circuit breakers described here. All of these discoveries are fundamental to the industrial development of electric generation and motive power. Page openly avowed the ambition in life to substitute electric for steam power, and though these attempts were practical failures because of the unavailability of adequate amounts of electrical energy, he may be considered one of the great forerunners of the age of electric power.

degrees (Figure 3); it must have been one of the very earliest of electric motors. This figure, he wrote,

represents a rotary or astatic galvanometer, with a single needle. m is the multiplier, composed of a number of turns of insulated wire. At c, an open collar passes through the center of the wires, to prevent any friction against the stem supporting

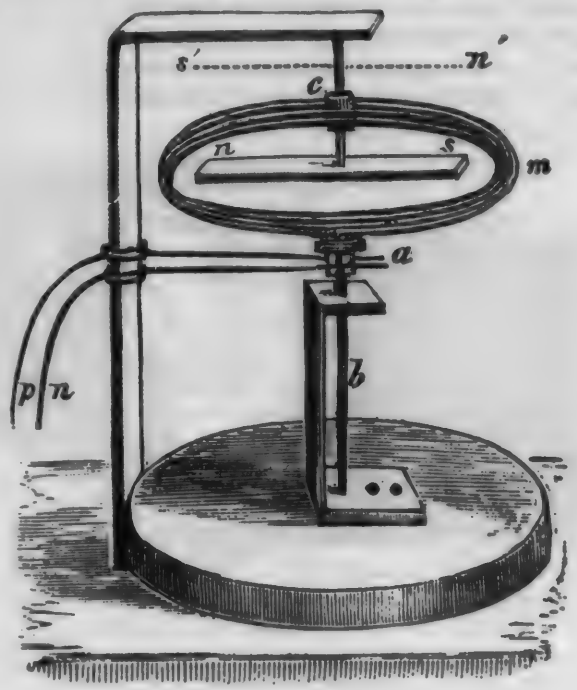


FIGURE 3.

Paige's revolving galvanometer with commutators. From ref. 35, p. 376.

the bar magnet N-S. The multiplier m is mounted for revolution on a slender shaft b, and has the ends of its wires soldered to semi-cylinders of silver at a, upon which the battery wires p n press with a slight spring. The cylindrical segments are not correctly represented in the figure. Their relation to the battery wires should be such that the direction of the current should change when the coil of wire is at right angles to the magnet (35, p. 376).

This device was quickly adapted to the current generator and reported in the next volume of *Silliman's Journal* in an article entitled "New Magnetic Electrical Machine of Great Power, with Two Parallel Horse-

shoe Magnets and Two Straight Rotating Armatures, Affording Each, in an Entire Revolution, a Constant Current in the Same Direction" (36). "The alternating currents from the semi-revolutions of the armatures," Page wrote, "are converted into a current of the same direction, by the application of my *pole-changer*. It consists merely of two insulated, metallic, cylindrical segments, secured on the shaft, and two stationary metallic tangent springs for conductors" (36. p. 165).

Wishing, in some applications, to interrupt the current periodically, Page devised various current slicers or "electrotomes" which would

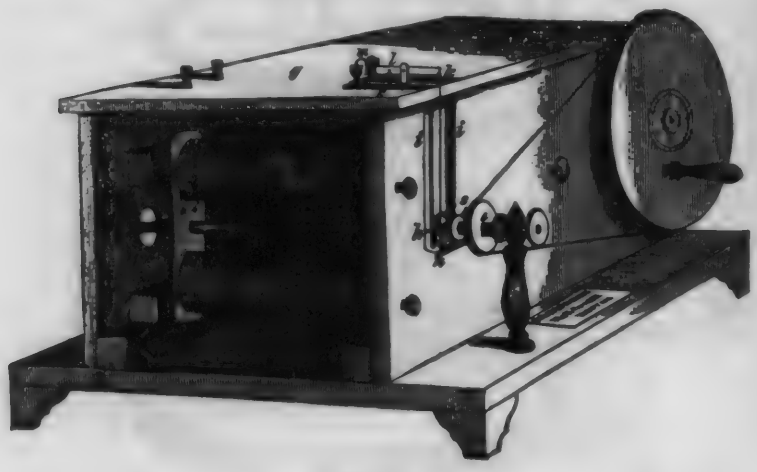


FIGURE 4.
Page's electrotome operating by cams (s) on the shaft of the generator. From ref. 36, p. 164.

interrupt the current at any phase of the cycle of rotation which produced it. One of these operating by means of cams mounted on the shaft of the generator, is shown in Figure 4. "The circuit, he said, in describing this figure, "is completed and broken by the rise and fall of the curved wire m, attached to the little lever 1. At 1, the lever is pulled down by a spiral spring. At the other end is fastened a string, which passes down to the lower lever n. This is worked by the revolving pins n s, attached to a moveable ferrule on the shaft. The pins n s are themselves binding screws, so that the ferrule may be adjusted in any position, and the circuit broken at any required time. This electrotome, as it may be called, is removed when decompositions are performed, and the platinum wires are

inserted in the mercury cups" (36, p. 16). Wheatstone [39] altered the name to Rheotome in 1843, in defining teminology used in an article describing several new instruments, as follows: "This may be the proper place to explain a few other terms which I have frequent occasion to use, though not in the course of the present communication. By *Rheotome* is meant an instrument which periodically interrupts a current . . ." (37, p. 307).

These simple arrangements of segment commutator and spring contacts were of course basic to the whole later development of industrial electricity, providing an indispensable key to the technology of current generation and motive power. In the course of this evolution it was soon noticed that the current produced was not simply related to the speed of rotation, but, in fact, diminished with increasing rates.

Studying this problem in an initial report published in *Poggendorf's Annalen der Physik und Chemie* in 1849, the Russian physicist Lenz,[40] having resort first to the electrolytic production of gas as a measure of the current produced, and later to a Schweigger galvanometer, connected through high resistance, found that reduction in current with increased rate of rotation was caused by secondary currents which require readjustment of the commutator assembly, depending upon the speed of rotation (38).

To analyse this effect Lenz decided upon the graphic analysis of the induced current, as it developed though a cycle of rotation. Obviously, a direct solution was unthinkable at a time when electrolysis and slow moving galvanometers were the only available current detectors, and Lenz made a most ingenious application of Page's commutator (39), describing it as follows:

---

[39] *Wheatstone, Sir Charles (1802-1875).* Beginning life as a maker of musical instruments, he soon exhibited his inventive genius in a memoir on a simple geometric means of predicting the form of Chladni figures (1833). He invented the stereoscope, initiated the science of spectroscopy, measured the rate of transmission of electricity, and was foremost in England in the development of this science. The well-known resistance bridge bears his name and in England he is credited with the discovery of the telegraph. He invented instruments for electrical measurement and control (e. g., the rheostat) and was a skilled cryptographer.

[40] *Lenz, Heinrich Fredrich Emil (1804-1865).* Lenz, a foremost Russian physicist, began his career as physicist to Kotzebue's expedition around the world in 1823-1826, later becoming Professor of Physics in St. Petersburg at the University and in the Artillery School. He is one of the founders of induction electricity giving his name to a law stating that "the direction of the induced current is in such a direction as to oppose the motion which induces it." The papers described here, and in particular the method of graphic analysis of the alternating-current wave are among the great landmarks of this science.

Turning to the continuation of my experiments on the influence of the rate of revolution on the strength of the induction current, I remark at the beginning, that even my first report made clear the advantages, in study of the action of magneto-electrical machines, of considering the phenomenon in its separate phases, that is, in the various positions of the iron cores in relation to the magnetic poles between which it moves, and that this examination could be greatly clarified by *graphic constructions*. I therefore began to study the strength of the current generated by induction in its various phases. To this end I had built for me a commutator of the following construction: A wooden cylinder GHJK (Figure 5, Lenz's Figure 3) perforated along its axis, was forced onto the axle M N of the magneto-electric machine, and could be fastened in any position by the screw EF. On both ends of the wooden roller two cylindrically-turned disks of iron, CD and AB, were fastened; CD remained a complete disk, but six sectors were cut out of AB and then filled

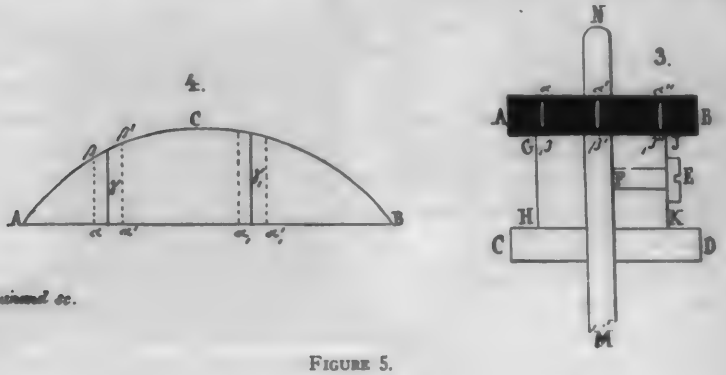


FIGURE 5.

Lenz's Rheotome mounted on the shaft of the generator MN.
From ref. 39, Pl. I, Fig. 3.

up with insulated sections of iron, so that the surface of the disk AB remained exactly cylindrical, but only six conducting strips of iron ab, a′b′ a″b″ . . . retained metallic connection with the central portion of the disk. These conducting strips were 3° broad, and their centers were exactly 60° apart (39, p. 136).

Lenz attached one terminal of the rotating coil to the central part of the disk AB, while the other end was attached to the lower, complete disk CD and sliding contacts were applied to the two disks, leading to the galvanometer. It is clear that current would flow through the galvanometer only when the spring contact sliding on AB touched the conducting strips ab, a′b′, a″b″, etc. Thus during rotation the galvanometer would receive a train of impulses reflecting the voltage at that particular phase of rotation. Incrementally advancing the setting of the pick-up contact AB throughout 60°, and measuring the deflection of the galvanometer at

each position, the entire induction wave could be mapped out as shown in Figure 6.

This technique of "sampling" the intensity of current during brief intervals and reconstructing a curve of intensity versus time is illustrated in Figures 7 to 9. In Figure 7 is a summary of the physics of a simplified alternating current generator in which a coil revolves between two magnetic poles. Figure 8 depicts how Lenz's segmented commutator or

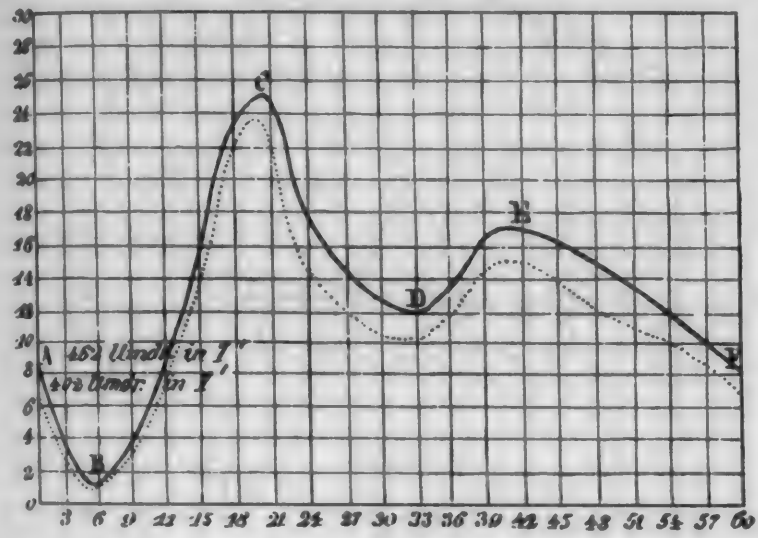


FIGURE 6.

Lenz's graph of current intensity through one induction cycle.
From ref. 39, Pl. I, Fig. 4.

rheotome sampled the various portions of the curve. Figure 9 shows how individual impulses summate in the slowly responding galvanometer to produce the terminal reading, and how the individual readings may be plotted to reconstruct the wave form.

Very closely related, and very possibly part of the background of Lenz's own work was that of Pouillet who recognized that an extremely brief current of a given intensity might impart a motion to the galvanometer that would take seconds to develop; while a current of the same intensity, only somewhat greater in duration, would evoke a greater response. This phenomenon he equated to the ballistic pendulum designed to measure the velocity of projectiles, and with this in mind he converted the galvano-

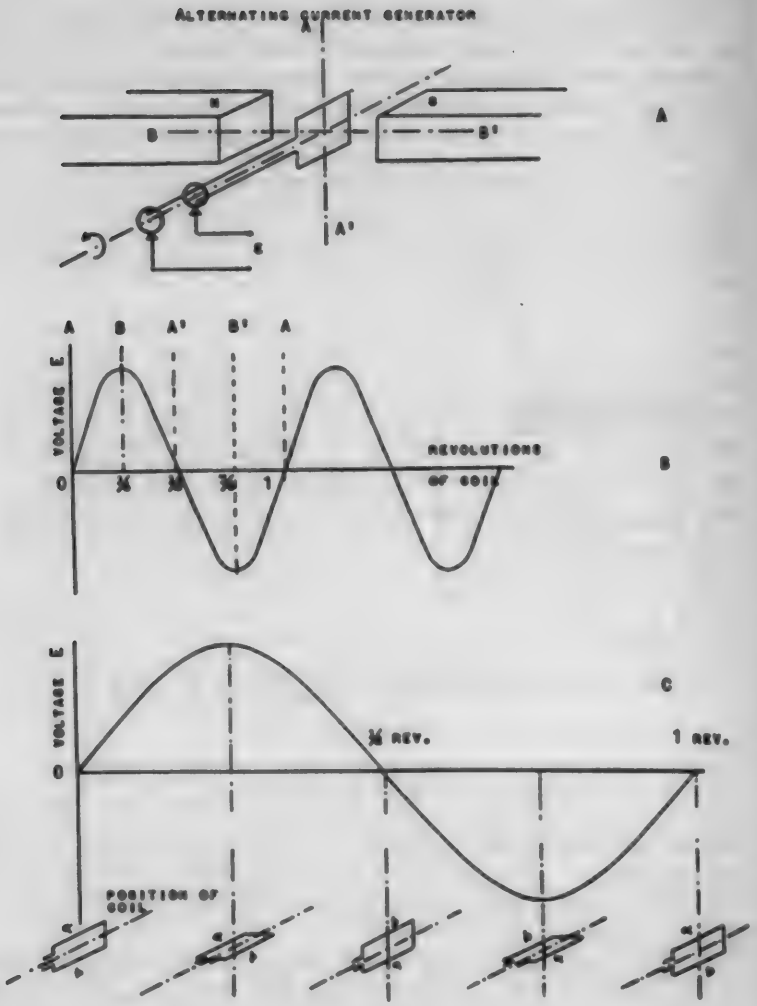


FIGURE 7.

The elementary physics of a simple alternating-current generator. Drawn by the authors.

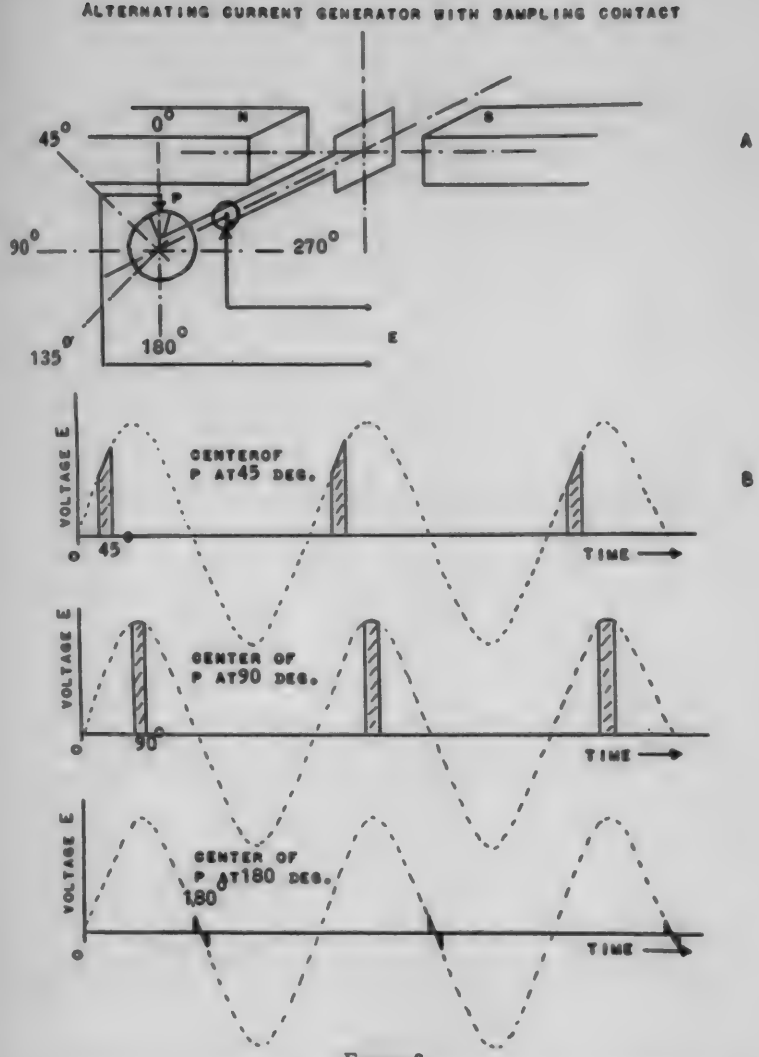


FIGURE 8.

Technique of sampling the output of an alternating current generator by means of Lenz's Rheotome. Drawn by the authors.

meter into what was essentially a ballistic galvanometer, calibrating it by introducing known and constant voltages for varying amounts of time, to be compared later with the deflections produced when, for instance, the

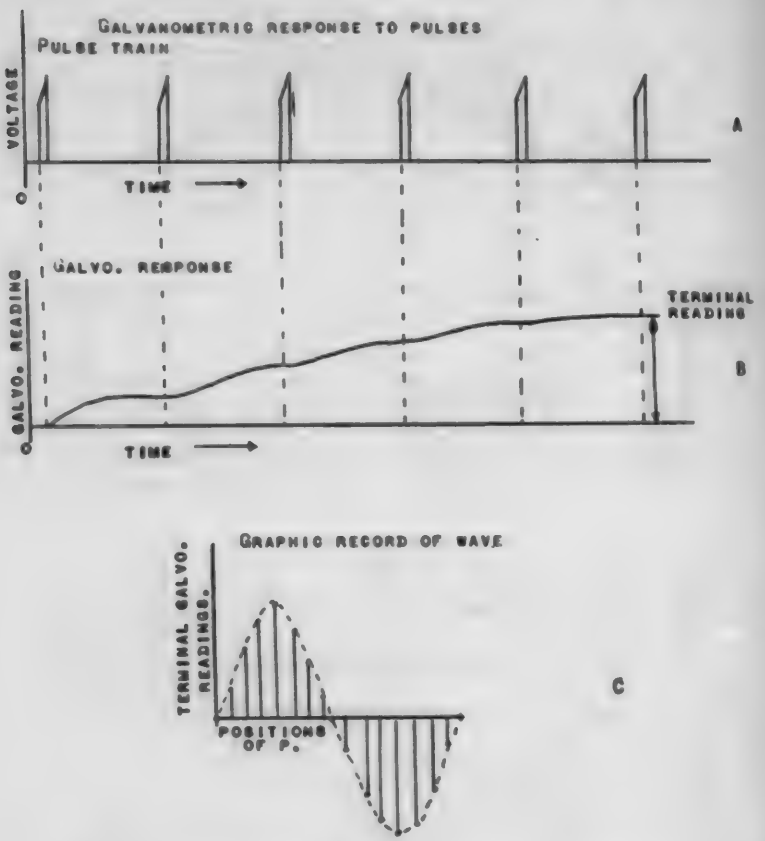


FIGURE 9.

Figure showing how individual pulses summate to produce a steady deflection in a slowly-responding galvanometer. Drawn by the authors.

fall of the hammer to fire a rifle started a current and the projectile broke a wire to arrest the current (30).

Calibration was achieved for intervals as small as 1/7000 sec. by an adaptation of chronography that appears to be based most directly upon

the disk chronographs and dynamographs of Morin,[31] which he devised under the direction of Poncelet[32] at the French Engineering School at Metz. These depended upon rotating disks of variable dimensions and speed, and marking the time course of an event graphically on paper attached to their surfaces. Knowing the rate of rotation and the circumference of a disk, the duration of radial displacements could be measured. Morin constructed graphic disks of this variety measuring accurately to 1/6000 sec. (40-43). Pouillet modified this system by placing a conducting segment in the path of a sliding contact pressing against the surface of the disk, and thus translated duration of contact into deflections of the galvanometer. This method was soon adopted by Helmholtz[33] to measure the rate of conduction in the nerve. The contact that stimulated the nerve started current flowing in the ballistic galvanometer, while the contraction of the muscle broke the circuit. The deflection of the galvanometer thus represented the latency of contraction, including the time for nerve conduction. When the nerve was stimulated at a greater distance from the muscle all the factors contributing to latency remained unchanged except alone that of conduction time in the nerve, and the difference in latency gave the time of conduction between the two locations stimulated (44).

Not long after Morin, Breguet[34] and Wheatstone called attention to

[31] *Morin, Arthur Jules (1795-1880).* A French engineering officer who attained the rank of General and served with honor in the defense of Paris in 1870, Morin was influenced by Poncelet to make a career in applied mechanics, and was "one of the artisans of the great industrial development which marked the middle of the nineteenth century." He experimented on weights, motion, ballistics, resistance of materials, hydraulics, turbines, and ventilation. The work described here was started at the Engineering School at Metz at the behest of Poncelet, who saw the need for a variety of self-registering dynamometers by which the efficiency of industrial and other sources of power could be assessed and adjusted. He was Director of the Conservatory of Arts and Crafts from 1849-1880.

[32] *Poncelet, Jean Victor (1788-1867).* French geometrician and physicist, who invented positional geometry while prisoner of the Russians, having been captured during Ney's rearguard action at the crossing of the Dnieper at Krasnoi during the retreat from Moscow. His new geometry being poorly received in France, he turned to applied mechanics of which he may be considered one of the founders. His textbook on applied mechanics is still a classic.

[33] *Helmholtz, Hermann Ludwig Ferdinand von (1821-1894).* A universal genius who held professorships in Anatomy and Physiology at Konigsberg, Bonn, and Heidelberg before returning to Berlin in 1871 as Professor of Physics. The versatilty which was one of his chief assets is illustrated by the catalogue of his accomplishments in science: The conservation of energy (1847), the velocity of the nerve impulse (1850), the invention of the ophthalmoscope (1850), and his theories of color vision, and resonance in audition.

[34] *Breguet, Louis Francois Clement (1804-1883).* French instrument-maker, grandson of the founder of a famous firm of instrument-makers that is still in existence. It was

similar electromechanical devices to measure brief intervals of time by the serial making and breaking of appropriate electrical circuits, and it seems reasonable to assume that all of these, and Pouillet's in particular, were progenitors of the Rheotome as it was now to be developed (45, 46).

Approaching the problem of charting the time course of the negative variation at du Bois-Reymond's behest, Bernstein saw that his apparatus had to fulfill two main criteria: first it had to deliver a momentary stimulus to the nerve or muscle and then, after a suitable interval, "sample" briefly the state of the nerve of muscle potential. The interval between stimulus and sampling period would have to be variable, so that the whole of the period of the action current could be "scanned," and its time and voltage course plotted, almost exactly as Lenz first scanned and then reconstructed the phases of the wave of alternating current, and as Pouillet had measured small intervals of time by contacts on the surface of a rapidly rotating disk. Bernstein combined both these functions in a single apparatus, making the stimulating current through contacts at the edge of a rotating disk, and briefly completing the recording circuit to a galvanometer by a second pair of contacts at the opposite edge. Radial displacement of the contact surfaces for stimulating and recording permitted variation in the temporal relationship of these two events.

Plate 1 (wrote Bernstein (47) in describing his rheotome), shows a vertical section through the axis of the rotating wheel of the apparatus constructed according to this principle. In an iron frame A, 13 cm. wide and 26½ cm. long, is found the bearing for the axle, a, in which turns a steel axle X. In about its center it carries a brass wheel r, to which the metal points above mentioned are attached [Figure 10, below].

Plate 2 shows the apparatus as seen from above. At the edge of the wheel r there stands a brass block m (cf. Plate 1), insulated by a piece of hard rubber RR, carrying the steel point p, which can be screwed up and down in a small ball. This slants downward, so that its upper part points in the direction of rotation. During rotation it can touch with its lower pointed end the fine copper wire d, which is stretched radially to the wheel R by a mechanism yet to be described, and in this way close the primary circuit of the inductorium [Figure 10, below].

In Plate I it can be seen that the lower bearing, a, lies in a step-like brass housing, hh. This is surrounded by a round, horizontal, brass disk ss, 9 cm. in radius, which one sees from above in Plate II. Immediately above this plate is a brass arm d rotating around the housing, upon which is located the mechanism carrying the wire d. This consists of a vertical tube y, having a guide in which a brass plug st can be raised and lowered by means of a micrometer screw. This

---

he who expanded the interest of the firm from clock-making to manufacture of physical instruments. Above all, he was the principal developer of the telegraph in France. He gave encouragement and counsel to Graham Bell.

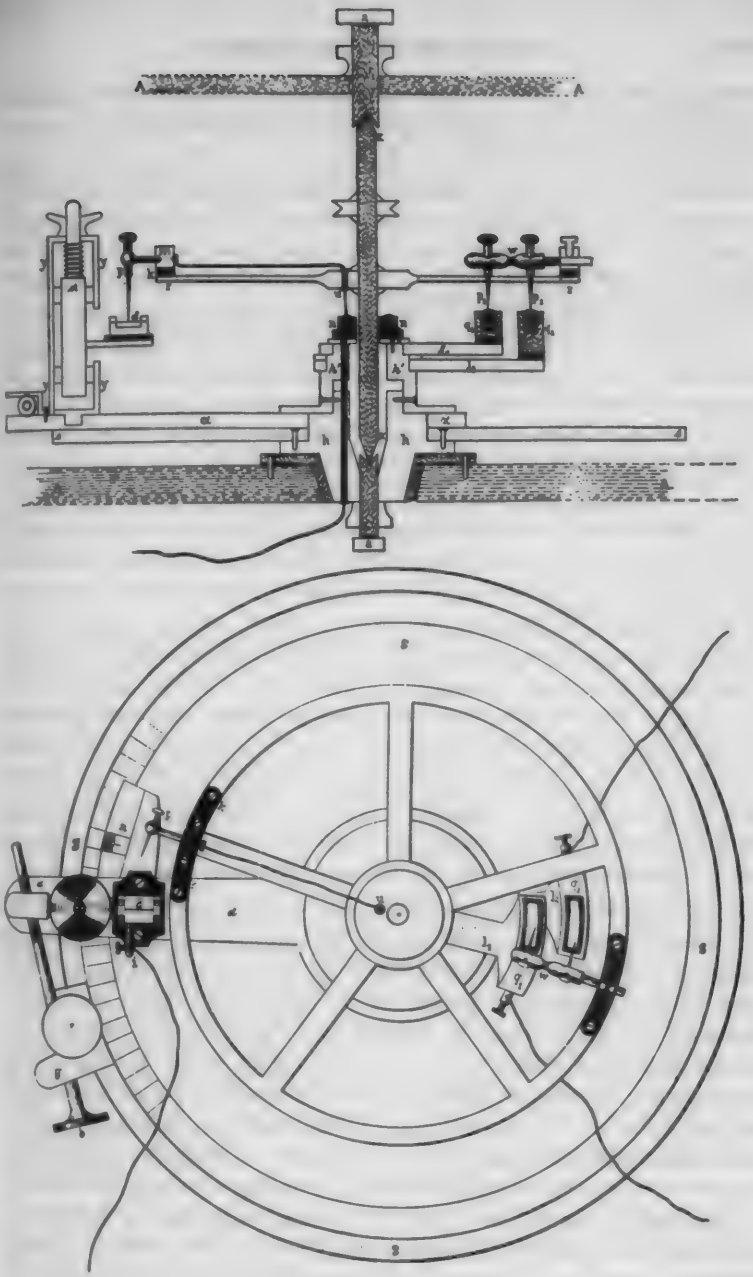


FIGURE 10.

Above, Bernstein's Rheotome seen in vertical section. From ref. 47, Plate I.
Below, Rheotome seen from the top. From ref. 47, Plate II.

plug has fastened to it a brass plate, which projects out through a slot in the outer cylinder, and carries an ivory plate. On the latter is located a u-shaped brass block, on which the wire d is stretched by clips.

A second step-like brass housing h'h', which is screwed upon the first, carries two rotating arms l_1 and l_2 which bear at their ends two trough shaped, steel cups of mercury, insulated from the brass arms by hard rubber. The points p_1 and p_2 are designed to graze the surface of the mercury found in q_1 and q_2. They can be racked up and down in the brass cylinder w, which is screwed on to the edge of the wheel through insulation by hard rubber.

The disk s (Table 2) has at its edge a graduation in 100 degrees. The arm a, movable above it, carries at its side a vernier on which one degree is divided in ten parts (cf. n). The screw b permits the finer displacement of this mechanism. It rests in a ball-and-socket joint beneath the brass piece g, which can be clamped on the edge of s by the set-screw t, and goes through the ball of a ball-and-socket joint at the end of the arm a, which serves as the receiver.

The current of the primary circuit is now lead to the wire d via the binding-post i. On contact between l and p it goes through a wire which passes through a hole in the wheel, to the circular mercury trough nn made of ivory, in the mercury of which it turns. From the bottom of the trough a wire passes in an insulated shaft through the housings, h and h' to the outside, where it forms the other pole of the primary circuit.

The muscle or nerve circuit is brought to q_1 and q_2 by two wires passing through a slot in disk s, and is briefly closed by the points brushing across the mercury. This closing time can be shortened at will by pushing arms l_1 and l_2 together.

The points p_1 and p_2, also out of steel, are finely and sharply pointed. They also are slanted with their upper ends in the direction of rotation and travel lightly over the surface of the mercury. To make this contact positive, they are daily copper plated at their points by dipping in copper sulphate solution. Moreover the mercury must be as pure as possible and be renewed daily. Then if the points are installed well, the contact is positive and hardly a trace of disturbance is perceptible on the mercury during rotation (47, pp. 176-178).

The duration of contact of p_1 and p_2, or the sampling interval, was calculated by lowering point p until it rested against the wire d, and thereafter rotating the disk r by turning the screw b. When p_1 made contact, the galvanometer, connected in series with a battery via contacts p_1 and p_2 began its excursion. On further rotation in the same manner, the moment when the circuit broke could be determined, and the angular displacement between make and break of the muscle or nerve circuit could be read from the dial. Knowing the rate of rotation in subsequent experiments, the time of contact could be established. In much the same manner the interval between stimulation and "sampling" could be determined.

Although it seemed likely from *a priori* reasoning that the behavior of the potential in muscle would be easier to study than that in nerve, Bernstein chose to begin with nerve because his starting point in these

studies had been in part the desire to determine whether the negative variation was conducted at the same rate as the nerve impulse, and hence whether the impulse and the negative variation were not identical. Helmholtz had of course measured the rate of conduction of the nerve impulse in frogs in 1850, and hence values were at hand for comparison (44).

In the actual experiments, the break of contact in the stimulating circuit followed the make so closely that virtually a single stimulus was given. Its duration was estimated at less than 1/20000 sec. and because of this, from 6 to 8 Grove cells were required to produce threshold stimuli. In the recording circuit the nerve current, which we would now call the injury current, was compensated by an opposing current from a Daniell cell, regulated by a rheochord. The duration of the sampling period was reduced to a minimum consistent with obtaining a readable deflection on the galvanometer; in some experiments this was as brief as 0.0003 sec.

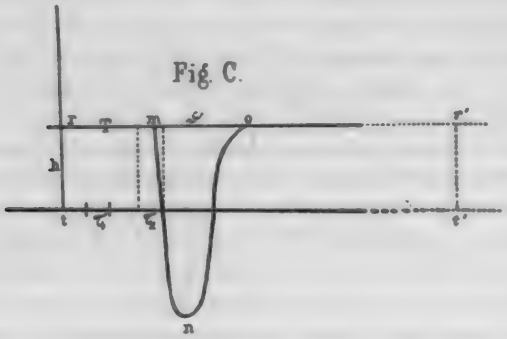
The experiment started with stimulus and recording contacts quite close together, and no signs of negative variation were seen. Only after the sampling followed the stimulus by a critical interval did signs of the negative variation appear. It in turn evolved during a measurable interval, and then disappeared, and potential differences could no longer be recorded. Thus the negative variation was separated from the stimulus by a measurable latent period and followed a characteristic course of rapid fall and somewhat slower restitution of the nerve potential.

Shortening the distance on the nerve between the stimulating and the recording electrode produced a reduction in latency, from which it was possible to calculate the rate of propagation of the negative variation. Eight such determinations on frog nerve gave an average value of 28.718 meters a second, corresponding closely enough with the values obtained by Helmholtz using the contraction of the muscle as the endpoint, to justify the conclusion that the excitatory process and the negative variation in nerve are propagated at the same velocity, and are, therefore, presumably identical processes. The total duration of the negative variation ranged from 0.5626 msec. to 0.8041 msec., with an average of 0.6759 msec.

Most significant in view of recent observations was the fact that the negative variation did not stop at the level of disappearance of the nerve potential, but went beyond, to exceed the nerve potential many fold. In the past this was usually interpreted as denoting incomplete killing at the site of injury, so that the full injury potential failed to be recorded. If the action-potential exceeded the injury potential by "many fold," this

would still have to be assumed even in light of our present knowledge of the approximate reversal of the resting potential at the peak of the spike.

From these data a graphic representation was constructed as shown in Bernstein's Figure C (Figure 11). The abscissa t, t′ represents the time



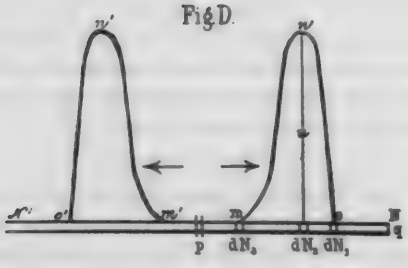


FIGURE 11.

Bernstein's reconstruction of the action potential along a time axis t-t′ representing one cycle of rotation of the Rheotome (Fig. C). The dotted lines indicate that this part of the graph is not drawn to scale. In Fig. D the spatial distribution of the two impulses set up by a single stimulus at p is plotted. This graph is to scale; the length of the nerve is 8 cm. From ref. 47, Pl. III, Figs. C and D.

of one revolution of the Rheotome, beginning with the stimulus t, while h represents the amplitude of the nerve current. T_1, T_2, etc. represent the sampling period, which may be varied at will between t and t′. (Actually the period of sampling was constant, and the stimulus was varied in relation to it.) R — m represents the latent period, and m — o the duration of the negative variation.

In Figure D a reconstruction was made of the spatial distribution of the impulse along the fiber. N′ represents a nerve fiber 80 mm. long. If the recording electrodes are placed at o and o′, and a stimulus delivered at p at zero time, the first sign of negative variation at o will appear in a time representing the conduction time from p to o. The sampling period is represented as dN_1. If the recording electrode had been nearer to p, at that same moment, later stages in the negative variation would have

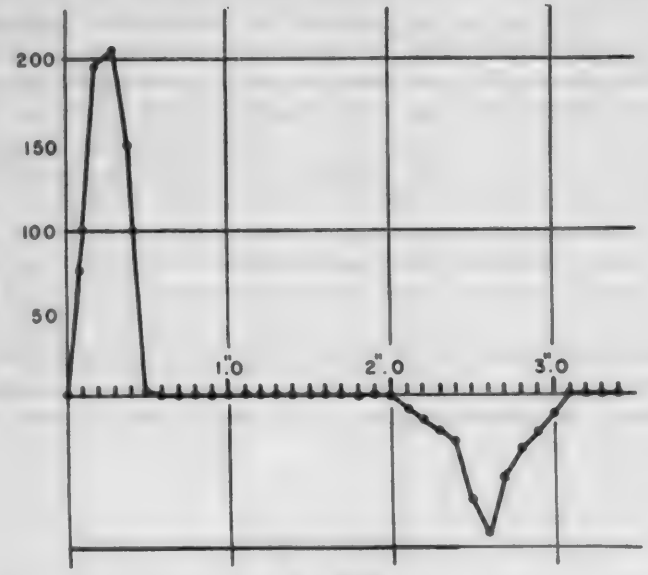


FIGURE 12.

Burdon-Sanderson's plot of the tortoise electrocardiogram. Thirty-five points were determined to make the reconstruction. From ref. 54, p. 402.

been sampled, such as at dN_2 and dN_3, and at m the end of the negative variation would have been noted. The distance m — o thus represents the spatial distribution of the negative variation, mno, with a maximum amplitude u. This length was calculated as 18.7 mm. Naturally a stimulus applied at p would set up another wave propagated at the same rate in the opposite direction. The wave m′n′o′ would thus be occupying the stretch of nerve m′o′ at the same instant.

Thus early in the electromechanical era, the time course of the action potential was plotted and its rate of propagation calculated with an accu-

racy that virtually matches that of their measurement today. Here the experimental basis was laid for the hypothesis of nerve conduction and nerve and muscle bioelectricity which was to be elaborated and enunciated more clearly by Bernstein himself during the next forty years.

Not much time was to elapse before the capillary electrometer of Marey and Lippmann (48), and the string galvanometer of Einthoven (49), with their capacity to record bioelectric events directly, and particularly to record single events, were to supplant the Rheotome, but for a short period the Rheotome was the paramount instrument of electrophysiology, serving in the demonstration of plant action potentials in the hands of Burdon-Sanderson (50) and, most importantly, permitting the first charting of the electrocardiogram by Marchand (51) and Engelmann (52). Shortly thereafter it was employed in the studies of the heart by Burdon-Sanderson and Page which established our present understanding of the nature of the T wave (53, 54) (Figure 12). In these and other tasks it served well in physiological laboratories until the beginning of the twentieth century, when, stripped of its "scanning" function it continued to be useful in the form of a variety of stimulus-triggering devices linked with one recording system or another. Finally, with the advent of the cathode ray tube, similar mechanical devices triggered the stimulus and generated the sweep of the electron beam, to place a standing wave before the viewer, presenting directly what Bernstein so painfully reconstructed nearly ninety years before.

BIBLIOGRAPHY

1. Burdon Sanderson, J. The mechanical, termal, and electrical properties of striped muscle. Schaefer's *Textbook of physiology* Vol. 2, 1900, 352-450.
2. Nobili, C. L. Analyse expérimentale et théorique des phénomènes physiologiques produits par l'électricité sur la grenouille; avec un appendice sur la nature du tétanos et de la paralysie, et sur les moyens de traiter ces deux maladies par l'électricité. *Ann. de Chem. et de Phys.* 1830, 2S, *44*: 60-94.
3. Schweigger, J. S. C. Zusätze zu Oersteds elektromagnetischen Versuchen. *J. f. Chem. u. Phys.* 1821, *31*: 1-41.
4. Oersted, J. C. Experimenta circa effectum conflictus electrici in Acum magneticam. *J. f. Chem. u. Phys.* 1820, *29*: 275-281.
5. Oersted, J. C. *La découverte de l'électromagnétisme faite en 1820 par J.-C. Oersted.* Ed. A. Larsen. Copenhagen, 1820.
6. Oersted, J. C. Neuere electro-magnetische Versuche, *J. f. Chem. u. Phys.* 1820, *29*: 364-369.
7. Oersted, J. C. Galvanic magnetism. *Phil. Mag.* 1820, *56*: 394.

8. Schweigger, J. S. C. Ueber Elektromagnetismus. Eine zur vierten Versammlung deutscher Naturforscher und Aerzte geschriebene Abhandlung. *J. f. Chem. u. Phys.* 1826, *46*: 1-72.
9. Nobili, C. L. Ueber einen neuen Galvanometer. *J. f. Chem. u. Phys.* 1825, *45*: 249-254.
10. Nobili, C. L. Comparaison entre les deux galvanomètres les plus sensibles, la grenouille et le multiplicateur à deux aiguilles, suivie de quelques résultats nouveaux. *Ann. de Chim. et Phys.* 1828, 2S, *38*: 225-245.
11. Matteucci, C. Action de la pile sur les substances animales vivantes. *Ann. de Chim. et Phys.* 1830, 2S, *43*: 256-258.
12. Matteuci, C. Mémoire sur l'électricité animale. *Ann. de Chim. et Phys.* 1834, 2S, *56*: 439-443.
13. Matteucci, C. Sur le courant électrique dela grenouille; second memoire sur l'électricité animale, faisant suite à celui sur la torpille. *Ann. de Chim. et Phys.* 1838, 2S, *68*: 93-106.
14. Matteucci, C. Deuxième mémoire sur le courant électrique propre de la grenouille et sur celui des animaux à sang chaud. *Ann. de Chim. et Phys.* 1842, 3S, *6*: 301-339.
15. Matteucci, C. Sur un phénomène physiologique produit par les muscles en contraction. *Ann. de Chim. et Phys.* 1842, 3S, *6*: 339-343.
16. Matteucci, C. *Lectures on the physical phenomena of living things.* London, Longman, Brown, Green, and Longmans. 1847.
17. Matteucci, C. Electro-physiological researches. On induced contractions — Ninth Series. *Phil. Trans. Roy. Soc.* Lond. 1850, *140*: 645-649.
18. Du Bois-Reymond, E. Vorläufiger Abriss einer Untersuchung über den sogenannten Froschstrom und über die elektromotorischen Fische. *Ann. der Phys. u. Chem.* 1843, *58*: 1-30.
19. Galvani, L. *Commentary on the effects of electricity on muscular motion.* Trans. Margaret A. Foley. 1953, Burndy Library, Norwalk, Conn.
20. Du Bois-Reymond, E. *Untersuchungen über thierische Elektricität.* Vol. 1. Berlin, Reimer, 1848, 56 + 743, 6 pt. Vol. 2, pt. 1. Berlin, Reimer, 1849, 608, pt. 1-4. Vol. 2, pt. 2, Berlin, Reimer, 1860-1884, 579, pt. 5-6.
21. Du Bois-Reymond, E. Untersuchungen über thierische Elektricität. Moleschott's *Untersuch. zur Naturlehre d. Mensch. u. der Thiere.* 1857, *2*: 137-157; 247-277.
22. Hermann, L. Weitere Untersuchungen über die Ursache der electro-motorischen Erscheinungen an Muskeln und Nerven. *Arch. f. d. ges. Physiol.* 1870, *3*: 15-45.
23. Hermann, L. Weitere Untersuchungen über die Ursache der electro-motorischen Erscheinungen an Muskeln und Nerven. *Arch. f. d. ges. Physiol.* *4*: 149-201.
24. Bernstein, J. *Elektrobiologie.* Braunschweig, Vieweg, 1912.
25. Du Bois-Reymond, E. Sur loi du courant musculaire, et sur la modification qu'éprouve cette loi par l'effet de la contraction. *Ann. de Chim. et Phys.* 1850, 3S, *30*: 119-127.
26. Du Bois-Reymond, E. Untersuchungen über thierische Elektricität. Moleschott's *Untersuch. z. Naturlehre d. Mensch .u. d. Thiere.* 1857, *3*: 125-172.

27. Du Bois-Reymond, E. Untersuchungen über thierische Elektricität. Moleschott's *Untersuch. z. Naturlehre d. Mensch u. d. Thiere.* 1858, *4*: 1-15.
28. Intelligence and Miscellaneous Articles. Deflection of the magnetic needle by the act of volition. *Phil. Mag.* 1849, *34*: 543-545.
29. Du Bois-Reymond, E. Sur la loi qui préside à l'irritation électrique des nerfs et sur la modification du courant musculaire par l'effet de la contraction. *Ann. de Chim. et Phys.* 1850, 3S, *30*: 178-188.
30. Pouillet (C. S. M.) Note sur un moyen de mesurer des intervalles de temps extrêmement courts, comme la durée du choc des corps élastiques, celle du débandement des ressorts, de l'inflammation de la poudre, etc.; et sur un moyen nouveau de comparer les intensités des courants électriques, soit permanents, soit instantanés. *C. R. Acad. des Sci.* 1844, *19*: 1384-1389.
31. Dove, H. W. [illegible] inducierte Ströme, welche bei galvanometrischer Gleichheit ungleich physiologisch wirken. *Ann. der Phys. u. Chem.* 1840, *49*: 72-98.
32. Verbesserungen an der magnet-elektrischen Maschine und Anwendung derselben zum Ingangsetzen des magnetischen Telegraphen. *Dingler's Polytechnisches J.* 1845, *99*: 46-48.
33. Saxton, J. Description of a revolving keeper magnet, for producing electrical currents. *Franklin J.* 1834, *17*: 155-156.
34. Page, C. G. Electro-magnetic apparatus and experiments. *Silliman's Amer. J. Arts & Sci.* 1838, *33*: 190-192.
35. Page, C. G. Rotary muliplier or astatic galvanometer. *Silliman's Amer. J. Arts & Sci.* 1838, *33*: 376-379.
36. Page, C. G. New magnetic-electrical machine of great power, with two parallel horse-shoe magnets, and two straight rotating armatures, affording each, in an entire revolution, a constant current in the same direction. *Silliman's Amer. J. Arts & Sci.* 1838, *34*: 163-169.
37. Wheatstone, C. An account of several new instruments and processes for determining the constants of a voltaic pile. *Phil. Trans. Roy. Soc. Lond.* 1843, *133*: 303-327.
38. Lenz, E. Ueber den Einfluss der Geschwindigkeit des Drehens auf den durch magneto-electrische Maschinen erzeugten Inductionsstrom. *Ann. der Phys. u. Chem.* 1849, *152*: 494-523.
39. Lenz, E. Ueber den Einfluss der Geschwindigkeit des Drehens auf den durch magneto-elektrische Maschinen erzeugten Inductionsstrom. *Ann. der Phys. u. Chem.* 1854, *92*: 128-152.
40. Morin, A. J. *Nouvelles expériences sur le frottement, faites à Metz en 1831.* Paris, Bachelier, 1832.
41. Morin, A. J. *Nouvelles expériences sur le frottement, faites à Metz en 1832.* Paris, Bachelier, 1834.
42. Morin, A. J. *Suite des nouvelles expériences sur le frottement, faites à Metz en 1833.* Paris, Bachelier, 1835.
43. Morin, A. J. *Notice sur divers appareils dynamométriques propres à mesurer le travail ou l'effort développé par les moteurs animés ou inanimés,* etc., etc., 2nd ed., Paris, Mathias, 1841.
44. Helmholtz. Note sur la vitesse de propagation de l'agent nerveux dans les nerfs rachidiens. *C. R. Acad. des Sci.* 1850, *30*: 204-206.

45. Bréguet, L. Note sur un appareil destiné à mesurer la vitesse d'un projectile dans différents points de sa trajectoire. *C. R. Acad. des Sci.* 1845, *20*: 157-162.

46. Wheatstone, C. Note sur le chronoscope électromagnétique. *C. R. Acad. des Sci.* 1845, *20*: 1554-1561.

47. Bernstein, J. Ueber den zeitlichen Verlauf der negativen Schwankung des Nervenstroms. *Arch. f. d. ges. Physiol.* 1868, *1*: 173-207.

48. Marey, E. J. Des variations électriques des muscles et du coeur en particulier, étudiées au moyen de l'électromètre de M. Lippmann. *C. R. Acad. des Sci.* 1876, *82*: 975-977.

49. Einthoven, W. Ein neues Galvanometer. *Ann. der Phys.* 1903, S4, *12*: 1059-1071.

50. Burdon-Sanderson, J. On the electromotive properties of the leaf of the Dionaea: *Phil. Trans. Roy. Soc. Lond.* 1882, *173*: 1-55.

51. Marchand, R. Beiträge zur Kenntniss der Reizwelle und Contractionswelle des Herzmuskels. *Pflüger's Arch. f. d. ges. Physiol.* 1877, *15*: 511.

52. Engelmann, T. W. Ueber das electrische Verhalten des thätigen Herzens. *Pflüger's Arch. f d. ges. Physiol.* 1878, *17*: 68.

53. Burdon-Sanderson, J., and Page, F. J. M. Experimental results relating to the rhythmical and excitatory motions of the ventricle of the heart of the frog, and of the electrical phenomena which accompany them. *Proc. Roy. Soc. Lond.* 1878, *27*: 410.

54. Burdon-Sanderson, J., and Page, F. J. M. On the time-relations of the excitatory process in the ventricle of the heart of the frog. *J. Physiol.* 1879-80, *2*: 384.

55. Burdon-Sanderson, J., and Page, F. J. M. On the electrical phenomena of the excitatory process in the heart of the frog and of the tortoise, as investigated photographically. *J. Physiol.* 1883, *4*: 327.

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE

REPORT OF THE

THIRTIETH ANNUAL MEETING

RICHMOND AND WILLIAMSBURG, VIRGINIA
MAY 6, 7 AND 8, 1957

THE PROGRAM

MONDAY, MAY 6

Morning

9:00- 4:00 Registration, Richmond Academy of Medicine

10:00-12:00 Council Meeting, Auditorium, Richmond Academy of Medicine

9:00-12:00 Tours of the Medical College of Virginia, starting from the Academy of Medicine Building

Afternoon

12:30 Luncheon, College Social Center. Guests of Medical College of Virginia

2:00- 4:00 General Session, Auditorium, Richmond Academy of Medicine

Wyndham B. Blanton, Presiding

1. Dr. Henry E. Sigerist—An Appreciation
   John F. Fulton, New Haven, Conn.
2. St. Luke, a Psychosomatic Prophet
   Nicholas Padis, Philadelphia, Pa.
3. The *Spongia Soporifera* in Medieval Surgery; Was It Ever Used?
   Loren C. MacKinney, Chapel Hill, N. C.
4. Some Aspects of Military Medicine in the Confederacy
   Courtney R. Hall, Flushing, N. Y.
5. J. Marion Sims: Inventor-Physician-Surgeon
   Emmett B. Carmichael, Birmingham, Ala.
6. Historical Relationship between Scientific and Lay Medicine for Present-Day Patient Education
   Bruno Gebhard, Cleveland, Ohio
7. Joseph Janiver Woodward—A Forgotten Pioneer in the History of Staining (Read by title)
   Morris C. Leikind, Washington, D. C.

4:15 Tea at the Valentine Museum, Guests of the History Section, Richmond Academy of Medicine

Evening

6:30 Dinner, Commonwealth Club. Guests of the Medical College of Virginia

Announcement of Awards

9:00 The Garrison Lecture: Morgagni's and Virchow's Pathology.
Paul Klemperer, New York, N. Y.

TUESDAY, MAY 7

Symposium on Colonial Medicine

Sponsored jointly by
Medical College of Virginia Foundation
and
American Association of the History of Medicine

9:00-12:00 Morning Session, Auditorium, Richmond Academy of Medicine

Samuel M. Bemiss, Presiding

Introduction

Benjamin Spector, Boston, Mass.

British Roots of American Colonial Medicine

1. Jacobean England
Sir George N. Clark, Oxford, England
2. The Seventeenth Century English Medical Background
John J. Keevil, Sussex, England *

12:30 Luncheon, College Social Center. Guests of Medical College of Virginia

2:00- 5:00 Afternoon Session, Auditorium, Richmond Academy of Medicine

R. Blackwell Smith, Presiding

Medicine in Colonial America

1. Old World Physicians and Medicine in the English Colonies, 1630-1715
Carl Bridenbaugh, Berkeley, Calif.
2. Medicine in Sixteenth Century Mexico
Saul Jarcho, New York, N. Y.
3. Medical Practice in Colonial America
Whitfield J. Bell, Jr., New Haven, Conn.

* In the absence of Dr. Keevil, his paper was read by *Lloyd G. Stevenson*, Montreal, Quebec.

4. Epidemics, Real and Imaginary, and Other Factors Influencing Seventeenth Century Virginia Population
Wyndham B. Blanton, Richmond, Va.

Evening

6:30 Cocktail Hour, Country Club of Virginia. Guests of Richmond Academy of Medicine

7:30 Annual Dinner, in Honor of Edward B. Krumbhaar, Country Club of Virgina

Benjamin Spector, Presiding

Seventy-Fifth Birthday Tribute to Dr. Krumbhaar
Esmond R. Long, Pedlar Mills, Va.

WEDNESDAY, MAY 8

Morning

10:00-10:45 Annual Business Meeting, Phi Beta Kappa Memorial Hall, College of William and Mary, Williamsburg, Virginia

11:00-12:15 General Session

Whitfield J. Bell, Jr., Presiding

1. Animal Diseases in Colonial America
J. F. Smithcors, East Lansing, Mich.
2. General John Beatty (1749-1826); Patriot and Physician
Fred B. Rogers, Philadelphia, Pa.
3. Medical Education in Wisconsin, the Half-Century 1848-1898
G. Kasten Tallmadge, Milwaukee, Wis.
4. Dr. Mary Edwards Walker (1832-1919)—Charlatan or Martyr?
Linden F. Edwards, Columbus, Ohio

Afternoon

12:30 Luncheon, Trinkle Hall Refectory. Guests of the College of William and Mary

1:45 Tour No. 1: Jamestown Festival Area
Tour No. 2: Colonial Williamsburg

EXHIBIT ON COLONIAL MEDICINE

As part of the program of the meeting, the Section on the History of Medicine of the Richmond Academy of Medicine prepared an extensive exhibit on colonial medicine, which is to continue on display through September 15, 1957, as part of the general celebration of the 350th anniversary of the settlement of Jamestown. The exhibit comprised a number of displays illustrating different aspects of colonial life of medical interest. These included an Indian medicine man, with typical herbs,

amulets, etc.; the office of Dr. John Potts, most noted of the early Jamestown physicians; a seventeenth century sick room, illustrating the procedure of cupping for the treatment of pneumonia; a scene illustrating nursing and midwifery in the seventeenth century; and a display of typical foods of the period, illustrating the contemporary diet. A notable feature of these exhibits was the use of authentic furniture, instruments, and other objects of the time. In addition there was an extensive display on pharmacy in colonial Virginia, with examples of some of the more important and highly regarded drugs in prominent medical use, as well as seventeenth century drug jars and medical books. A model of the first hospital was also presented, as well as six plaques describing the effects of famine, disease, and other disasters on the population growth in the early years. Altogether these interesting and informative exhibits formed a notable contribution to the program of the meeting.

In addition, the first eight of a series of paintings by Robert Thom on the history of medicine were displayed on loan from Parke-Davis & Company.

Committee on Local Arrangements

WYNDHAM B. BLANTON, *Chairman* — WILLIAM T. SANGER
SAMUEL M. BEMISS — R. BLACKWELL SMITH
EDWARD M. HOLMES, JR.

Committee on Program

GENEVIEVE MILLER, *Chairman* — HENRY R. VIETS
WHITFIELD J. BELL, JR.

COUNCIL MEETING

The President, Dr. Benjamin Spector, called the Council Meeting to order at 10:30 a.m. on Monday, May 6, 1957, at the Richmond Academy of Medicine, Richmond, Virginia.

I. REPORT OF THE EXECUTIVE COMMITTEE

The Secretary-Treasurer then presented the following report of the Executive Committee:

The meeting of the Executive Committee was called to order at 9:00 a.m., May 6, 1957. New members of the Association were elected, and the reports of the Osler Medal and Welch Medal committees read and accepted. In accordance with the provisions of the Constitution the Executive Committee elected Dorothy M. Schullian to the Executive Committee to complete the unexpired term of Erwin H. Ackerknecht, resigned.

The Executive Committee also reports that it has received an invitation to hold the 1959 annual meeting of the Association in Los Angeles, and that it would like some expression of opinion from the members of the Council before coming to a decision. The Executive Committee recommends to the Council that the President be authorized to appoint a committee on plans to commemorate Dr. Henry E. Sigerist. Finally, the Committee would like to announce that, upon the invitation

of the New York Academy of Medicine and the Rockefeller Institute for Medical Research, the annual meeting of the Association in 1958 will be held in New York City.

Upon motion duly made and seconded, the Council approved the report of the Executive Committee. The Council then proceeded to take up the questions proposed by this report.

With regard to the possibility of meeting in Los Angeles, Dr. Henry R. Viets spoke in favor of accepting the invitation, assuring the members that the sponsors in Los Angeles would be sure to put on a good meeting. Dr. Owsei Temkin suggested that, since many members of the Association would be precluded from going to Los Angeles because of the distance, it might be worth considering the possibility of holding two meetings during the year, one at Los Angeles and the other at a place more accessible to the majority of the membership. Dr. Linden F. Edwards also spoke in favor of this suggestion. The question was also raised, whether the Association should not consider the possibility of meeting again in Atlantic City, if not annually as in the past, then at least once. The President then reported that the Executive Committee would take these views into consideration before deciding on a meeting place for 1959.

Upon motion duly made and seconded, the Council authorized the President to appoint a committee on plans to commemorate Dr. Sigerist.

II. REPORT OF THE SECRETARY-TREASURER

During the past year, the Secretary-Treasurer has as usual handled a variety of more or less routine correspondence incident to the duties of the office. One gratifying result of this work has been the election of 52 new members of the Association. Unfortunately there has also been a number of losses by resignation and death, so that the total net gain is 18 members. The membership totals last year (as of April 13) and this year (as of May 1) are as follows:

	1957	1956	Gain
Honorary Members	7	8	(1)
Constituent Societies	25	24	1
Active Members	502	487	15
Nonresident Members	18	15	3

The financial picture, though not exactly glowing, is somewhat brighter than it was last year. The chief reason, of course, is that The Johns Hopkins University continues to pay the deficit on the *Bulletin of the History of Medicine*, amounting in 1956 to $4,175.43. We are also greatly indebted to the excellent management and the generosity of the local committees and sponsors both this year and last in arranging the annual meetings without any expense to the Association treasury. Moreover, through the good offices of our accomplished President, we have again been most generously favored by Mr. Joseph Fabian Ford, of Brookline. Mr. Ford, who enabled the Association to establish the Welch Medal in 1950, has during the past year donated another $250.00. In addition, the Association has also received a gift of $75.00 from another generous friend of Dr. Spector, Dr. David D. Berlin, of Boston. These donations have been set aside in a special fund to be

called the President's Discretionary Fund. I also take pleasure in reporting that we have received a number of smaller donations from members of the Association, and in offering thanks for the valued support of those who have paid dues as contributing or sustaining members. In this connection, I should like to point out that during the past year an exemption application was filed with the Internal Revenue Service, which has now given its opinion that this Association is a scientific and educational organization. This means that gifts to it are deductable for income tax purposes and also, of course, that the Association itself is exempt from paying income tax. In return the Association is required to file an annual information return.

Partly to meet the requirements of this return, but prin. 'y to give the members of the Association a better picture of its financial condition, the accounts of the Association have now been set up on the basis of a fiscal year running from November 1 to October 31. These dates were chosen to coincide with what should normally be the period of least financial activity, that is, after most of the bills for one year have been paid and before the dues for the next go out. This arrangement will reflect as clearly as possible the operations of a single year. Submitted herewith are the statements for the most recent fiscal year, 1955/56; these represent a consolidation of my accounts with those of my predecessor, Dr. Emerson Crosby Kelly.

Classified Statement of Receipts and Expenditures

1 November 1955—31 October 1956

General Operating Fund

Receipts:		
Balance on hand, 1 November 1955		$1,548.42
Membership dues		
For 1954 and earlier years	$ 18.00	
1955	138.00	
1956	3,321.26	
1957	16.00	3,493.26
Donations		38.50
Loan	100.00	
Loan repaid	100.00	0.00
		$5,080.18
Expenditures:		
Subscriptions to Bulletin of the History of Medicine		
For 1955	$1,567.39	
1956	2,720.45	$4,287.84
Adminstration		
Secretarial expenses	35.00	
Printing	244.55	
Postage	71.15	
Miscellaneous	15.89	366.59

Honors and Awards		
Welch Medal	43.44	
Osler Medal	54.33	
Garrison Lecture	100.00	197.77
Miscellaneous		
Bibliography of History of Medicine	21.89	21.89
		$4,874.09
Balance on hand, 31 October 1956		206.09
		$5,080.18

President's Discretionary Fund

Receipts:		
Gifts		
Dr. David D. Berlin	$ 75.00	
Mr. Joseph F. Ford	250.00	$ 325.00
		$ 325.00
Expenditures:		
Paid out		0.00
Balance, 31 October 1956		$ 325.00
		$ 325.00

Statement of Balance

31 October 1955

Assets:		
Cash on hand		$1,548.42
Accounts receivable		
Back dues	$ 126.00	
Credits with Johns Hopkins Press	52.61	178.61
		$1,727.03
Liabilities:		
Accounts payable		$1,615.00
Net worth:		
Surplus reserves		112.03
Total liabilities and net worth		$1,727.03

31 October 1956

Assets:	
Cash on hand	$ 531.09
Accounts receivable: back dues	6.00
	$ 537.09

LIABILITIES:		
Accounts payable	$ 35.84	
1957 dues prepaid	16.00	$ 51.84
NET WORTH:		
President's Discretionary Fund	$ 325.00	
Surplus reserves	160.25	485.25
Total liabilities and net worth		$ 537.09

I would like to draw your attention to the increase of $48.22 in the surplus reserves in the balance sheets for October 31, 1955 and 1956. Of this increase $30.00 reflects the fact that $156.00 in back dues were collected against an expected collection of only $126.00 (accounts receivable, 31 October 1955). The remaining $18.22 increase in the reserves represents the excess of ordinary operating receipts over expenditures. In other words, during 1955/56 the Association operated on a very close margin, and it is only the generosity of others that saved us from dangerously depleting the very small existing reserves.

Fortunately, the record so far this year appears more hopeful. The following schedule presents receipts and expenditures up to May 1 of the current fiscal year:

GENERAL OPERATING FUND

RECEIPTS:		
Balance on hand, 1 November 1956		$ 206.09
Membership dues		3,356.36
Miscellaneous		16.18
		$3,578.63
EXPENDITURES:		
Subscriptions to Bulletin		
1956	$ 38.34	
1957	2,725.00	$2,763.34
Administration		
Secretarial expenses	$ 42.50	
Postage	39.24	
Miscellaneous	20.53	102.27
Osler Contest expenses		27.04
Bibliography reprints		24.66
		$2,917.31
Balance on hand, 30 April 1957		661.32
		$3,578.63

PRESIDENT'S DISCRETIONARY FUND

RECEIPTS:	
Balance on hand, 1 November 1956	$ 325.00
EXPENDITURES:	
Expenses of incorporation committee	$ 5.78
Balance, 30 April 1957	319.22
	$ 325.00

Taking into account anticipated receipts and expenditures from now until October 31, it appears likely that the Association will operate in the black this year and show a much needed increase in its very low reserves.

In conclusion, I should like to say that special thanks are due to Mrs. Elizabeth Shock, formerly Periodicals Manager of The Johns Hopkins Press, and to her successor, Mrs. Margaret Zeeveld, for the time and effort they expended in helping to keep the membership and subscription records in order; and I should also like to thank our President, Dr. Spector, and the other members of the Executive Committee for their uniformly helpful advice and cooperation.

Respectfully submitted,
JOHN B. BLAKE, *Secretary-Treasurer*

III. REPORT OF THE DELEGATE TO THE INTERNATIONAL SOCIETY

The report of the Delegate, Dr. Ralph H. Major, was published in the *Bulletin* for January-February, 1957, pp. 87-88.

IV. ELECTION OF NEW CONSTITUENT SOCIETIES

Upon motion duly made and seconded, the Council unanimously elected as Constituent Societies, the Benjamin Waterhouse Medical History Society, of Boston, Massachusetts, and the Handerson Medical History Society, of Cleveland, Ohio.

V. NOMINATION OF HONORARY MEMBER

Upon the motion of Dr. Temkin, the Council unanimously nominated Dr. Walter Pagel for election as an Honorary Member of the Association.

VI. REPORTS OF COMMITTEES

Editorial Committee

Dr. Lloyd G. Stevenson, chairman, reported that the Editorial Committee had gathered and edited abstracts of the papers presented at the Durham, N. C., meeting of the Association and made a selection of the papers (including the Osler Medal Essay) for recommendation to the editor of the *Bulletin of the History of Medicine*. Moreover, the Committee edited the report of the meeting as prepared by the Secretary-Treasurer.

From the editor of the *Bulletin* the Committee learned that during the past year 179 pages of material were published stemming from the activities of the Association. Of 37 signed articles, 19 were contributed by members of the Association.

Welch Medal Committee

The Committee on the Welch Medal, having considered the literature of the last five years, has voted that no award be made in 1957.

STEWART C. THOMSON
W. F. NORWOOD
ILZA VEITH
SAUL JARCHO, *Chairman*

Osler Medal Committee

The William Osler Medal Committee has examined ten essays submitted from eight medical schools in six states of the United States and one province of Canada. It recommends that the Medal be awarded to Sebastian R. Italia of the Yale University School of Medicine for his essay "Elisha North: Experimentalist, Epidemiologist, Physician, 1771-1843." It further recommends that Honorable Mention, together with a one-year subscription to the *Bulletin of the History of Medicine*, be awarded to William D. Sharpe of the Johns Hopkins University School of Medicine for an essay entitled "Isidore of Seville and the Tradition of Medicine in the Early Middle Ages" and to Russel W. Van Norman of the University of Texas Southwestern Medical School for an essay entitled "Antebellum Physicians of Dallas, Texas."

This is the fourth successive year in which the Medal has been awarded to a representative of the Yale University School of Medicine. The signs seem to point to a very special fostering of the history of medicine there and to a very personal encouraging of students who manifest an interest in the field. It is also worthy of note that three of the essays were submitted from one school in Canada which boasts an Osler Society and where the memory of a previous chairman of this committee, who has since departed to another Canadian center, apparently remains very green.

The Committee extends its thanks to those journals which have carried announcements of the contest this year. It makes the plea that in the future each member of the Association urge medical students of his acquaintance to enter the contest and that he actively promote their investigations. Essays should be presented from more than six of forty-eight states, and there should be representation from the Far West.

Respectfully submitted on behalf of the Committtee, consisting of Dr. George J. D'Angelo, Prof. Charles D. O'Malley, and

DOROTHY M. SCHULLIAN, *Chairman*

Committee on Research in American Medical History

Dr. Richard H. Shryock, chairman, reported that the Committee had been unable to make any progress during the year. He recommended that, if the Committee were to accomplish its task, it might be advisable, because of the press of his other commitments, to appoint a new chairman.

Committee on Bibliography

Dr. Genevieve Miller, chairman, reported that the annual Bibliography of the History of Medicine in the United States and Canada for 1955 had been published in the November-December, 1956, issue of the *Bulletin*. She reported that the Committee was still hoping to compile a mailing list for reprints of the bibliography, three hundred of which are now ordered by the Association, and that she would greatly appreciate suggestions and ideas from the members with regard to particular places or types of institutions that should be placed on the list.

Committee on the Teaching of the History of Medicine

Although Dr. David A. Tucker, Jr., chairman, was unable to present a complete report, he drew attention to two courses in the history of medicine not previously reported: one is at the University of California at Los Angeles School of Medicine and was started in 1952; the other, at Temple University School of Medicine, consists of six lectures illustrated by slides given to the first year class by Dr. Fred B. Rogers. Dr. Tucker also reported that Dean William N. Parkinson of Temple had proposed a medical history alcove in the medical school library to house historical items from the parent North Philadelphia Dispensary (1816), this section to honor Dr. Victor Robinson, Professor of History of Medicine at Temple from 1929 to 1946.

The Secretary would also like to draw the attention of interested members to certain sections of a report on "The Teaching of Anatomy and Anthropology in Medical Education," published as *Journal of Medical Education*, vol. 31, no. 10 (October, 1956), part 2. From this it appears that, of 560 fourth-year medical students responding to a questionnaire, 58 per cent stated that they had been introduced to a brief account of the history of anatomy, given either as separate lectures or as part of a course in the history of medicine. Of the 234 who did not have such instruction, 61 per cent would have welcomed it. Only about 80 of the 560 students either did not have or did not want a brief account of the history of medicine (see p. 61). It is also interesting to note that 71 per cent of the fourth-year students reported that more emphasis on the humanities and social sciences in pre-medical education would have been helpful (p. 39). One may perhaps wonder, however, to what extent this result arises from a genuinely felt need, and to what extent it is conditioned by current pronouncements of prominent educators on the importance of the humanities in the education of scientists.

VII. REPORTS OF CONSTITUENT SOCIETIES

Alabama Society of Medical History

Report for the year 1956-57

Officers:	President:	Dr. Ben C. Moffett
	Vice-President:	Dr. Louise H. Branscomb
	Secretary-Treasurer:	Mrs. Sarah C. Brown
	Editor of the Bulletin:	Miss Mary McCain

Program: Five meetings were held during the year. Faculty members, students, and the general public were invited.

October 25, 1956: Dr. Tinsley R. Harrison, "Great Men I Have Known in Medicine."

December 13, 1956: Dr. E. Neige Todhunter, "Three Centuries of Guinea Pigs." Mrs. Mildred Whatley, "The Lecture Notes of William McCants, Medical Student—1856."

January 31, 1957: Miss Barbara Webster, "The History of Nursing in Alabama."

March 6, 1957: Mr. Henry Schuman, "The Lawrence Reynolds Rare Book Collection."

April 25, 1957: Dean Robert C. Berson, "The History of Medical Education."

The Society inaugurated a quarterly bulletin (mimeographed), *De Historia Medicinae*. Volume 1, no. 1, appeared in October 1956. Miss Mary McCain was appointed as Editor.

In order to stimulate an interest in medical history among the students at the Alabama Medical Center, a motion picture series on medical history has been sponsored by the Society during October through February. Both faculty and students were invited and attendance was gratifying. The following films were shown: "One Against the World"; "The Conquest of Pain"; "The Renaissance"; "A Way in the Wilderness"; "The Story of Penicillin"; "Magic Bullets"; "The Medical Motion Picture—Its Development and Present Application"; "The Tragic Hour of Dr. Semmelweis"; and "Triumph over Deafness."

There are 61 members in the society and attendance at the regular meetings varied from 50 to 200.

EMMETT B. CARMICHAEL, *Delegate*

American Academy of the History of Dentistry

The Fifth Annual Meeting of the American Academy of the History of Dentistry was held on September 28 at Atlantic City. The program was as follows:

President's Address, by John E. Gurley, College of Dentistry, San Francisco, California.

"Some Early History of the Pennsylvania Association of Dental Surgeons," by Harold L. Faggart, Temple University.

"Progress Report on the Centennial History of Dentistry," by Robert W. McCluggage, Assistant Professor of History, Loyola University, Chicago.

"The Early History of Dental Amalgam," by George Dickson, National Bureau of Standards.

"Shakespeare and Dentistry," by Gardner P. H. Foley, Professor of Dental History, University of Maryland.

"The Use of Porcelain in Dentistry from Pierre Fauchard (1728) to Charles H. Land (1847-1922)," by Cut Proskauer, Columbia University.

"The Life of Charles Henry Land (1847-1922)," by L. Laszlo Schwartz, Columbia University.

The Sixth Annual Meeting of the Academy will be held November 1, 1957, at Miami Beach, Florida.

The *Bulletin of the History of Dentistry*, official organ of the Academy, continues

publication as a two-page mimeographed bulletin distributed to members and other interested persons on request.

The Academy is cooperating in an advisory capacity with George B. Griffenhagen, Curator, Division of Medicine and Public Health, Smithsonian Institution, with regard to exhibits to be placed in the Hall of Dental History in the new Museum of History and Technology.

GEORGE B. DENTON, *Delegate*

American Institute of the History of Pharmacy

The American Institute of the History of Pharmacy, pharmaceutical counterpart of the A.A.H.M., held its 1957 meeting at the Hotel Statler, New York, on April 30. Two noteworthy events of the meeting were a historical program honoring George Urdang upon the approach of his 75th birthday (June 13) and secondly, the announcement of Dr. Urdang's retirement as Director of the Institute, which he has headed since the founding in 1941.

The annual meeting is held, by recent custom, in conjunction with the meeting of the American Pharmaceutical Association. This year the historical session consisted of four papers presented by former graduate students of Dr. Urdang in pharmaceutical history at the University of Wisconsin. These were "Early Russian Military and Naval Formularies" by Alex Berman (now Assistant Professor of Pharmacy at the University of Michigan); "A Confederate Recipe Book" by Norman H. Franke (Assistant Professor of Pharmacy at the Alabama Polytechnic Institute); "The Canadian Formulary, 1905-1949" by Garnet R. Paterson (Associate Professor of Pharmacy at the University of Toronto, and Director since its foundation in 1955 of the Canadian Academy of the History of Pharmacy; Dr. Paterson was Dr. Urdang's only graduate minor); and "Universal Pharmacopoeias of the 18th Century" by Glenn Sonnedecker (Associate Professor of Pharmacy at the University of Wisconsin, holding the chair in pharmaceutical history occupied by Dr. Urdang, 1947-52).

The Report of the Director during the business session indicated the range of publications and activities of the Institute during 1956, as summarized below:

I. Publications Sent to A. I. H. P. Members

1. Alex Berman, *A Striving for Scientific Respectability: Some American Botanics and the Nineteenth-Century Plant Materia Medica* (booklet).

2. Roy A. Bowers and David L. Cowen, *Rho Chi Society* [National Honorary Pharmaceutical Society] (booklet).

3. George Griffenhagen, *Pharmacy Museums* (booklet).

4. George Urdang, "The Editor Rufus A. Lyman" (reprint from *Amer. J. Pharm. Educ.*, Vol. 20, No. 1, 1956).

5. "A. I. H. P. Notes" (Newsletter of the Institute), Vol. II, Nos. 1-3. (Complimentary copies were sent to all teachers of the History of Pharmacy).

6. Reproduction of frontispiece from Martin Pansa, *Pharmacotheca Publica et Privata* (1622), with explanatory essay.

II. Other Publications and Activities of the Staff

1. The Secretary, Dr. Glenn Sonnedecker, presented addresses in London, England; Vienna, Austria; Hameln, Germany; Beirut, Lebanon; and Washington.

D. C. during 1956. Articles by the Secretary appeared in the *Pharmaceutical Journal* (British); *Modern Pharmacy; Lebanese Pharmaceutical Journal; Österreichische Apotheker Zeitung;* and *Bulletin of the American Society of Hospital Pharmacists* (the latter being reprinted in the *Wisconsin Druggist*).

2. Contribution of the pharmaceutical part of the annual "Bibliography of the History of Medicine of the United States and Canada" to the *Bulletin of the History of Medicine.*

3. Participation in the mid-year meeting of the House of Delegates of the American Pharmaceutical Association, Washington, D. C., in which the Institute holds representation.

4. Pictorial History of Pharmacy. (a) Pictorial pages in the monthly journal, *American Professional Pharmacist* were contributed by the Director for the 15th consecutive year, under the title "Forty Centuries of Pharmacy." (b) The Director completed his co-operation on the series of pharmaceutico-historical paintings commissioned by Parke, Davis, and Co., for which the Institute's assistance had been engaged.

III. Miscellaneous

1. A variety of individuals and organizations made use of the Institute's slide-talk, "Evolution of the Drugstore," the first of a series.

2. The institute supplied historical information on a wide range of topics to inquirers both from within and without the field of pharmacy.

3. Recognition awards for historical writing on hospital pharmacy were presented to two hospital pharmacists.

4. Rho Chi Honor Society deposited the historically significant documents from its records with the Institute for preservation in the Kremers Reference Collection.

5. To pharmaceutical libraries, on request, the Institute distributed the pioneering study, *Chronicle of Philippine Pharmacy During the Spanish Period,* by Fr. Lorenzo Rodriguez, through the generous co-operation of the University of Santo Tomas and the author. [Now out of stock].

6. The Institute made available to members, at its cost price, the German pharmaceutical calendar for 1957 edited by the pharmacist-historian, Dr. Wolfgang-Hagen Hein, in co-operation with the Deutscher Apotheker Verlag. [Now out of stock].

7. The award of the George Urdang Medal was withheld by the Institute in 1956, since the evaluation committee of the International Academy of the History of Pharmacy lacked a majority vote in considering the qualifications of candidates proposed.

8. Copies of the Institute's booklet, *Pharmacy's Part in Society* continued to be distributed upon request to high school libraries, vocational counselors, and prospective students of pharmacy, as a co-operative project with the American Foundation for Pharmaceutical Education. The demand exhausted the second printing of this special edition near the end of the year.

The Council designated George Urdang Director-Emeritus, in acceding to his request for retirement from active direction of the Institute. The new Director, effective July 1, 1957, is Glenn Sonnedecker, who has been Secretary since 1949. Sonnedecker is succeeded by Ernst W. Stieb, a graduate student majoring in the

history of pharmacy and the history of science at the University of Wisconsin. Other officers for 1957 are: George Bender of Detroit, President; Hugo H. Schaefer of Yonkers, N. Y., First Vice-President; H. George Wolfe of New York, N. Y., Second Vice-President; Sylvester H. Dretzka of Milwaukee, Wisconsin, Treasurer; and A. H. Uhl of Madison, Wisconsin, Chairman of the Council.

The University of Wisconsin is the host institution for the Institute's office. Inquiry about the A. I. H. P. or its services may be addressed to the Director, Prof. Glenn Sonnedecker, American Institute of the History of Pharmacy, Chemistry Building, Madison 6, Wisconsin.

ERNST W. STIEB, *Secretary*

College of Physicians of Philadelphia, Section on Medical History

The Section on Medical History of the College of Physicians of Philadelphia has presented a varied program during the past year. The President of the College, Dr. Lewis C. Scheffey, appointed the following Fellows to serve on the Executive Committee of the Section, which now has 152 members: Drs. Maurice S. Jacobs, Herbert T. Kelly, Samuel X. Radbill; the Chairman, Dr. Nicholas Padis, and the Clerk, Dr. Fred B. Rogers. Dr. Radbill represented the Section at the Annual Meeting of the American Association of the History of Medicine in Richmond, Virginia, on May 6-8, 1957.

Five meetings were held by the Section in 1956, and three to May, 1957. A symposium on "Faith and Healing: Origins of Psychosomatic Medicine," was presented at Mitchell Hall of the College on October 9, 1956. Dr. Leandro M. Tocantins, Secretary of the College, presided at this meeting. Speakers on this program were: Rev. Ernest Gordon, Dean of the Chapel, Princeton University; Dr. Nicholas Padis, Chairman of the Section on Medical History; Dr. Kenneth E. Appel, Professor of Psychiatry, University of Pennsylvania; and Dr. Edward Weiss, Professor of Clinical Medicine, Temple University. These papers were published in the *Transactions & Studies* of the College for February 1957.

On December 4, 1956, President Scheffey chaired a program honoring the recent restoration of the birthplace of John and William Hunter at Long Calderwood in Scotland. The Section's program included: Dr. Jane M. Oppenheimer, Professor of Biology, Bryn Mawr College, "John and William Hunter and Some Eighteenth Century Scientific Moods"; Dr. George M. Austin, Professor of Neurosurgery, University of Oregon, "John Hunter and the Significance of His Neurological Research"; and Dr. J. Richard R. Bobb, Associate Professor of Physiology, Bowman-Gray School of Medicine of Wake Forest College, Winston-Salem, N. C., "William Hunter's Observations on Arterio-venous Aneurysms."

In recognition of his outstanding contributions to medical history in this country and abroad, the Section on Medical History has named its medical student essay contest prize in honor of Dr. Edward Bell Krumbhaar, Past President of the College and Emeritus Professor of Pathology at the University of Pennsylvania.

Winner of the first Krumbhaar Award for the best essay submitted by medical students from Philadelphia's five medical schools was Dr. Marshall Smith of New Brunswick, N. J. Dr. Smith, a 1956 graduate of the University of Pennsylvania School of Medicine now interning at the Hartford Hospital in Connecticut, received the one hundred dollar cash prize and certificate for his essay on

"Leonardo da Vinci and Andreas Vesalius—A Comparison." Honorable mention was awarded to Dr. Stuart H. Shippey, Jr., of Philadelphia, who also received his medical degree in 1956 at the University of Pennsylvania, where he is now an intern. Dr. Shippey's essay concerned "Biographies of Some Professors of Medicine at the University of Pennsylvania." The winning essay will appear in the *Transactions & Studies* of the College for August 1957.

Dr. Krumbhaar, who celebrates his 75th birthday this year, presented the awards at the Section's meeting on February 12, 1957. President Scheffey and Dr. Padis, Chairman of the Section, presided at this meeting and at dinner honoring the guests of the Section. Dr. Stanley P. Reimann of the Lankenau Hospital Research Institute and Dr. Samuel X. Radbill, former Chairman of the Section on Medical History, paid tribute to Dr. Krumbhaar's work in pathology and medical history. Dr. Reimann spoke on "The Edward Bell Krumbhaar Award in Medical History," and Dr. Radbill cited "Edward Bell Krumbhaar: Medical Historian, Bibliophile and Humanist." These two papers will appear in the College's *Transactions & Studies* for June 1957.

Also at this meeting honoring Dr. Krumbhaar, Dr. Herbert J. Dietrich, Jr., a Fellow of the College, read his translation of the original Latin manuscript of John Lawrence's "Oration on the Birthday of Medical Honors in America" (First Medical Commencement Address, University of Pennsylvania, 1768). Dr. Whitfield J. Bell Jr., Associate Editor of The Papers of Benjamin Franklin, next spoke of "John Redman: Medical Preceptor of Philadelphia; with Remarks on Dr. Redman's Essay on Inoculation." Dr. Bell recently found this *Essay on Inoculation* in *The Pennsylvania Gazette* for 1760.

A photo-reproduction of John Lawrence's manuscript, with an introduction and translation by Dietrich, will also appear in the *Transactions & Studies* of the College of Physicians of Philadelphia for June 1957. Dr. Bell's study on Dr. Redman, who was first President of the College in 1787, together with the long-lost essay on inoculation will be published in the *Transactions & Studies* in August 1957. An introduction to the Redman essay will be provided by Dr. Genevieve Miller of the Cleveland Medical Library.

Robert Scott Stevenson, F.R.C.S. of Gibraltar, author of *Goodbye Harley Street* and other books on otolaryngology and medical history, delivered the Kate Hurd Mead Class of 1888 Lecture in Medical History of the Woman's Medical College of Pennsylvania on April 9, 1957. Dr. Stevenson's topic was "The Changing Scene in Harley Street." This annual dinner meeting and lecture is sponsored by the Woman's Medical College, in conjunction with the Section on Medical History of the College of Physicians of Philadelphia.

Dr. Herbert J. Dietrich, Jr., was recently elected Clerk of the Section on Medical History, succeeding Dr. Rogers, who will become Chairman on the completion of office of Dr. Padis.

FRED B. ROGERS, *Clerk*

George W. Corner History of Medicine Society

The George W. Corner History of Medicine Society (University of Rochester, New York) met in December 1956, at which time Dr. George H. Whipple, Dean Emeritus, spoke on "Great Men at Johns Hopkins, 1900-1905."

In February 1957, the second meeting of the Society featured a paper by Dr.

John Romano, Professor of Psychiatry, entitled "The Singular Affection of Gaspard Viesseux" and a description of "Medical School in Heidelberg, Germany" by Robert Murray, a third year medical student.

The Society plans two additional meetings during the remainder of the 1956-1957 academic year.

The officers for 1956-1957 are as follows:

President:	Richard F. Bakemeier, 4th year
Vice-President:	William S. Hammond, 3rd year
Secretary:	C. Raymond Shepardson, 3rd year
Publicity:	Floyd Short, Student Fellow in Bacteriology

RICHARD F. BAKEMEIER, *President*

The Innominate Society for the Study of Medical History, Louisville, Kentucky

The Society membership during the past year has been as follows:

July 1, 1956: 25 Active Members; 7 Senior Members; 1 Honorary Member
Current: 25 Active Members; 8 Senior Members; 1 Honorary Member

There has been one death, Dr. Charles H. Maguire, who died suddenly of a coronary occlusion on November 23, 1956, while beginning an operation at St. Joseph's Infimary. There have been no resignations. One member, Dr. H. V. Noland, was given Senior Membership during the past year.

According to the long established custom of this society, the wives have met regularly in homes of the members on the same evening as the meeting of the active members.

Programs presented through the year have been as follows:

October 9, 1956: "Dr. Albert Schweitzer," by Dr. Robert Lich, Jr.
November 13, 1956: "Growing Pains" (Pediatric Surgery), by Dr. Charles H. Maguire.
December 9, 1956: "Notes of a Century in Obstetrics," by Dr. Lawrence T. Minish.
February 12, 1957: "First Aid to Kentucky" (Dr. Thomas Walker), by Dr. Clayton McCarty.
March 12, 1957: "The History of Treatment of Varicose Veins," by Dr. Roy H. Moore, Jr.
April 9, 1957: "Trauma in Ancient Egypt: The Edwin Smith Papyrus," by Dr. Rudolf J. Noer.

RUDOLF J. NOER, *Secretary-Treasurer*

The Johns Hopkins Institute of the History of Medicine

The complete annual report for the Institute will be published as usual in the *Bulletin*.

RICHARD H. SHRYOCK, *Director*

The Johns Hopkins Medical History Club

During the academic year 1956-57, the Johns Hopkins Medical History Club held

four meetings, two of which have been announced in the *Bulletin* (vol. 30, 1956, p. 576; vol. 31, 1957, p. 90). The third was a special meeting in association with the Institute of the History of Medicine on April 15, 1957, to honor the memory of Henry E. Sigerist. Speakers were Dr. Sigerist's long-time associates at the Johns Hopkins Institute, Drs. Edelstein, Larkey, and Temkin, and his successor, Dr. Shryock. The last meeting on April 29 presented a Harvey Tercentenary Program which was as follows: "Harvey and Before. Recent Contributions to the History of Cardiovascular Physiology," Owsei Temkin; "The Rev. Stephen Hales: His Contributions to Cardiovascular Physiology," Philip Bard; "The Contributions of a Medical Student (Rouanet), a Veterinarian (Chauveau) and an Engineer (Reynolds) to the Understanding of Cardiovascular Sound," Victor A. McKusick. Officers for the year were: Victor A. McKusick, president; Richard H. Shryock, vice-president; John C. Harvey, secretary; Owsei Temkin, delegate to the American Association of the History of Medicine.

OWSEI TEMKIN, *Delegate*

New York Academy of Medicine, Section on Historical and Cultural Medicine

During the past twelve months, seven papers that had been read before the Section have been published in the *Bulletin of the New York Academy of Medicine*. They are:

"Florence Nightingale's Place in British History," by Sir Francis B. A. Rundall (July 1956).

"Florence Nightingale's Influence on Nursing," by Margaret G. Arnstein (July 1956).

"Florence Nightingale's Influence on Military Medicine," by Frank B. Berry (July 1956).

"Manuel Garcia's Contribution to Laryngology," by Louis H. Clerf (August 1956).

"Manuel Garcia: The Artist and Scientist," by John D. Kernan (August 1956).

"The Influence of J. Marion Sims on Gynecology," by Claude E. Heaton (September 1956).

"The Centenary of Addison's Disease," by S. Zelig Sorkin (November 1956).

At a regular meeting of the Section on May 9, 1956, the following officers were elected: Alan F. Guttmacher, Chairman; Richard B. Stark, Secretary; and Hilton H. Stothers, member of the Advisory Committee. After that, Dr. Sorkin presented his paper and Dr. Edward C. Kendall opened the discussion.

On November 28, Dr. Juan A. Pons, Secretary of Health for the Commonwealth of Puerto Rico, described the activities of his department; Dr. Beatrice B. Berle spoke on "Social and Cultural Factors Influencing Hospital Utilization by Puerto Rico Migrants"; and Dr. Clarence Senior spoke on "Welfare and Health Problems amongst Puerto Rico Migrants in New York City."

On January 22, 1957, Dr. George W. Corner reported on "Contemporary Medical Education in England"; Dr. Perrin Long presented a paper on "Goals in Medical Education"; and Dr. Joseph C. Hinsey traced the "Development of Full-time Teaching from the Flexner Report to the Present."

On March 27, the topic was "Military Medicine under the Confederacy." Dr. Richard B. Stark spoke on "Surgical Care of the Confederate States Army"; and Prof. H. H. Cunningham of Elon College read a paper on "The Confederate Medical Officer in the Field."

Officers for the coming year will be: Chairman, Richard B. Stark; Secretary, Delaven V. Holman; Member of the Advisory Committee, Alan F. Guttmacher.

McIver Woody, *Delegate*

Ohio Academy of Medical History

The Ohio Academy of Medical History held its Fifth Annual Meeting in Cleveland, Ohio, on April 26 and 27, 1957. Following a subscription dinner at the Wade Park Hotel on Friday evening, April 26, Dr. Harold Feil of Cleveland gave an illustrated lecture on the story of the foxglove. On the following day seven papers were presented at the meeting, which was held in the Herrick Room of the Allen Medical Library; in the early afternoon a visit was paid to the Howard Dittrick Museum of Historical Medicine and at 4:00 p.m. the members enjoyed a tea and guided tour of the Cleveland Health Museum. Dr. David A. Tucker, Jr., of Cincinnati, a charter member of the Academy and of its antecedent organization, the Ohio Committee on Medical History and Archives, was elected to honorary membership in the Academy.

The excellent program was arranged by the President, Dr. Henry H. Fertig, Director of the Howard Dittrick Museum of Historical Medicine, who was ably assisted by Drs. Genevieve Miller and Bruno Gebhard, the Local Committee on Arrangements. The following officers were elected for the coming year: Dr. Leon Goldman, of Cincinnati, President; Dr. Chauncey D. Leake, of Columbus, President-Elect; and Mr. John O. Marsh, of Columbus, Secretary-Treasurer.

The Ohio Academy of Medical History is an affiliate of the Ohio Historical Society, which was formerly known as the Ohio State Archaeological and Historical Society. According to the constitution of the Academy it shall meet at least once a year at the time of the annual meeting of the Historical Society, although it does not stipulate where the meeting shall be held. Traditionally the annual meetings have been held at the Ohio State Museum in Columbus. However, this year the Academy, by a majority vote of its membership, inaugurated an innovation, namely, holding its annual meeting in the city of the incumbent president, a movement designed to stimulate local interest, and to alternate meetings between central, northern and southern Ohio. The present membership of the Academy is 70 and the attendance at the Cleveland meeting was 25.

Linden F. Edwards, *Delegate*

Sir William Osler Society for the History of Medicine, University of Pennsylvania

Activities 1956-57

October: Introductory remarks by the President.
Dr. John Brobeck, Professor of Physiology, "Froehlich and His Syndrome."

November: Peter Pugliese, "Paleopathology—Diseases of Prehistoric Man" (student paper).
Dr. Oscar V. Batson, Professor of Anatomy, Graduate School of Medicine, "The Vertebral Veins."

January: G. E. Engstrom, Jr., "D. Hayes Agnew" (student paper).
Dr. Christian Lambertsen, Professor of Pharmacology, "Frogmen."

February: James Bryan, "Oliver Wendell Holmes, Physician" (student paper).
Dr. F. William Sunderman, Professor of Clinical Medicine, Jefferson Medical College, "Borodin, Physician, Scientist, Composer, Musician."

April: Annual Honor Lecture, Dr. Francis C. Grant, retiring Professor of Neurosurgery and sponsor of the Osler Society since its inception five years ago, "A Brief History of Neurosurgery."

In addition, our Society served as a sort of "midwife" at the birth of a new Osler Society at our sister school, the Jefferson Medical College.

G. E. Engstrom, Jr., *President*

Providence Medical History Society

The Providence Medical History Society is a small organization of practicing physicians in Providence and we have no elaborately planned program during the year. We have three small informal meetings with invited guests at which time papers are presented on some phase of medical history by members of the organization. This past year has shown greatly increased interest in our organization and the papers which have been presented have been of considerable interest.

Again this year, Dr. Irving Beck, of Providence, has been appointed as a delegate to the national society.

Elihu S. Wing, Jr., *Secretary*

Richmond Academy of Medicine, Section on the History of Medicine

Under the Chairmanship of Dr. E. M. Holmes, the Section on the History of Medicine has been busy working on arrangements for the meeting of the Association in May. The Jamestown Festival Medical Exhibit has been set up in the basement of the Academy and was opened at the time of the meeting.

Patty Rose Boatwright, *Secretary-Treasurer*

Society for the History of Medical Science, Los Angeles

The Society for the History of Medical Science scheduled four general membership meetings and three Council meetings during the year just past. Membership for the year totalled 192, of whom 134 were active members, 46 associate members, and 12 honorary members. Officers for the year were Dr. Robert Moes, President, Dr. Charles Sawyer, Vice-President, Miss Louise Darling, Secretary, Dr. Clarence Agress, Treasurer, and Dr. Lawrence Powell, Archivist. Dr. Robert Tschirgi served a second year as Program Chairman and Dr. William Norwood was appointed delegate to the annual meeting of the American Association of the History of Medicine, Richmond, Virginia, May 6-8, 1957.

Programs for the general meetings were as follows: For the fall meeting, Dr. William Norwood of the College of Medical Evangelists spoke on "Deborah Sampson, Alias Robert Shirtliff, Fighting Female of the Continental Line, the Life of the Only Woman Who Enlisted as a Member of the Continental Armed Services as Seen by a Medical Historian." Dr. Francisco Guerra, Professor of Pharmacology at the National University of Mexico, gave the winter lecture on "Medicine in Spanish America during the Colonial Period." For the spring meeting, Dr. Ilza Veith of the University of Chicago School of Medicine spoke on "Far Eastern Medicine." The June meeting is to be an observance of the tercentenary of William Harvey's death; a dinner meeting is planned, at which Dr. Edgar Mauer of the University of Southern California School of Medicine will speak on "Harvey in London." In addition, a Harvey exhibit drawn from the collection of Dr. Myron Prinzmetal of the University of California at Los Angeles School of Medicine is to be shown through June and July in the UCLA Biomedical Library.

The John Fulton Medal Competition was broadened to include interns and residents as well as medical school students in the Los Angeles area and the closing date changed from mid-May to mid-September in order to give entrants the summer vacation period for writing their essays. No award was made for 1956/57.

LOUISE DARLING, *Secretary*

Society of Medical History of Chicago

List of Meetings

October 17, 1956: Francis J. Gerty, M. D., Professor and Head, Department of Psychiatry, University of Illinois College of Medicine, "The Story of Three Women."

Joseph H. Kiefer, M. D., Associate Professor, Department of Urology, University of Illinois College of Medicine, "The History of Lithotomy."

November 20, 1956: Lester King, M. D., Clinical Professor of Pathology, University of Illinois, Pathologist, Illinois Masonic Hospital, "Apothecaries and Physicians in the Early Eighteenth Century."

Franklin C. McLean, M. D., Professor Emeritus of Physiology, University of Chicago, "Medical Education in China."

December 19, 1956: Aldo A. Luisada, M. D., Associate Professor of Medicine, The Chicago Medical School and Mount Sinai Hospital, "The Heart in History."

George Halperin, M. D., Associate Editor, *Journal of the American Medical Association*, "Theodore Billroth."

January 16, 1957: Carroll L. Birch, M. D., Professor of Medicine, University of Illinois, "The History of Hemophilia in the Royal Family."

Percival Bailey, M. D., Director, State Psychopathic Institute, "The Seat of the Soul."

February 13, 1957: L. Margueriete Prime, Director, Library and Department of Literary Research, American College of Surgeons, "Larrey, Surgeon Raconteur."

Barry J. Anson, Ph. D., Chairman, Department of Anatomy, Northwestern

University Medical School, "The Debt of Medicine to Ancient Greece and Rome."

March 7, 1957: Ilza Veith, Ph. D., Assistant Professor of the History of Medicine, University of Chicago, "Benjamin Rush, Reformer, Psychiatrist, Physician."

Herman H. Henkle, Librarian, John Crerar Library, "Illustration Mobile."

April 17, 1957: Ralph A. Reis, M. D., Professor, Obstetrics and Gynecology, Northwestern University Medical School, "The Development of Midwifery in the United States."

Samuel J. Pearlman, M. D., Associate Professor, Department of Otolaryngology, Northwestern University Medical School, "Johann von Mikulicz—His Life."

LEO M. ZIMMERMAN, *Secretary-Treasurer*

Frederick R. Taylor History of Medicine Society, Winston-Salem

During the past year (April through April), the Frederick R. Taylor History of Medicine Society has enjoyed meetings marked by programs featuring both local and visiting speakers. The following is a summary of the year's activities:

On April 16, 1956, Dr. Martin Netsky, of the Bowman Gray School of Medicine, presented a paper on "The First Description of the Meningioma," and Dr. Blaine Nashold, Assistant Resident in Neurosurgery, presented a paper on "Sir William Osler." During the same program, the Frederick R. Taylor History of Medicine Society Award for the best paper of the year presented by a student to the society, was presented to Zeb Burton for a paper on "Dr. I. Semmelweis." The following officers were elected for 1956-57: Earl W. Parker, President; Zeb Burton, Vice-President; and Bernard Vick, Secretary-Treasurer.

On October 18, 1956, the members and guests enjoyed a program which included "Trephination," a paper given by Dr. Blaine Nashold; "Notes on the History of Some Drugs," by Miss Louise MacMillan, assistant editor of the *North Carolina Medical Journal*, and a movie which featured the life of Dr. W. S. Halsted.

On February 21, 1927, the society was fortunate in having as its speaker Dr. Warner Wells of the Department of Surgery of the University of North Carolina Medical School, who spoke on "Medical Practice among Southern Indians."

During the year, 17 new members were added to the roll, and 25 of the older members were active in attendance and participation.

BERNARD VICK, *Secretary-Treasurer*

The History of Medicine Society of Tulane University of Louisiana

We are pleased this year to be able to report that two delegates from Tulane's society will attend the national meeting.

Our society, although small, is an active one. We have just had the honor of hearing Dr. Frank B. Rogers, the Director of the National Library of Medicine, speak on the subject of "Medicine and History." We trust that interest in the history of medicine here at Tulane will be further stimulated by the many interesting papers to be presented at the meeting of the Association.

CRAWFORD LONG, *President*

The Robert Wilson Medical History Club of Charleston

Program, 1956-57

October 4, 1956: "Contagious Disease and History," by Dr. Leon Banov, Sr.
December 6, 1956: "Mutilations," by Dr. James Wilson.
January 3, 1957: "Professors of Surgery at the Medical College," by Dr. F. E. Kredel (presented by Dr. Brown).
February 7, 1957: "Cryptic Controversial Cardan," by Dr. J. H. Hoch.
March 7, 1957: "Fees in Medical History," by Dr. Leon Banov, Jr. Talk by Mr. Henry Schuman.
April 4, 1957: "Psychiatry 1657-1957," by Dr. Norton Williams.
May 9, 1957: (Title not available), by Dr. H. S. Pettit.

J. I. WARING, *Delegate*

VIII. OTHER BUSINESS

Upon motion duly made and seconded, the Council passed the following resolution:

Resolved, That the American Association of the History of Medicine express to the Board of Regents its appreciation for their efforts in behalf of the National Library of Medicine, and its support in securing high priority for the construction of a new library at Bethesda.

Dr. Ilza Veith reported on the aspirations of several members of the Association and others, some of whom are now at the National Institutes of Health, for the development of something in the nature of a National Institute of the History of Medicine. After some discussion the President, Dr. Spector, with the approval of the Council, appointed a committee consisting of Dr. Ilza Veith, chairman, Dr. Robert B. Livingston, and Dr. H. W. Magoun, to report further to the Association on what plans were being made to organize such an institute. [Dr. George W. Corner and Dr. John B. Blake were later added to the committee.]

Upon motion duly made and seconded, the Council then adjourned sine die.

BUSINESS MEETING

The President, Dr. Benjamin Spector, called the Annual Business Meeting of the membership to order at 10:30 a. m., on Wednesday, May 8, 1957, at Phi Beta Kappa Memorial Hall, College of William and Mary, Williamsburg, Virginia.

The President then read a cablegram of greetings from Dr. Erwin H. Ackerknecht, and upon motion duly made and seconded the Association directed the Secretary to send its return greetings to Dr. Ackerknecht. The Secretary was also directed to express to Dr. John J. Keevil the best wishes of the members and their regrets that he was unable to be present at the meeting.

I. NECROLOGY

Dr. Spector asked the members to stand while the Secretary read the names of the members who had died since the last meeting:

Edward H. Hume	Nelson G. Russell
James M. D. Olmsted	Henry E. Sigerist
H. Winnett Orr	H. Roswell Wahl
Frank L. Pleadwell	C.-E. A. Winslow

Upon motion duly made and seconded, the Association passed the following resolution, which was proposed by Dr. Temkin:

Resolved, That the American Association of the History of Medicine records its deep sense of loss in the passing of Dr. Henry E. Sigerist. He took a keen interest in the activities of this Association, serving it as President, as Editor, and as Secretary. In the latter function he initiated a reorganization of the Association and brought about a connection with the *Bulletin of the History of Medicine* as its official organ. His scholarship was ever at the service of the Association, his indefatigable devotion stimulated all its activities, and the charm of his personality gave its gatherings human warmth. The Association recognized Dr. Sigerist's eminence as a medical historian by making him the first recipient of the William H. Welch Medal. By electing him to honorary membership, the Association but honored itself. The memory of the man and of his work will remain with us and will be cherished.

II. REPORT OF COUNCIL MEETING

The Secretary spoke briefly on the most important transactions at the Council meeting; the full report is printed above.

Upon the nomination of the Council, recorded above, the Association unanimously elected to Honorary Membership Walter Pagel, M. D., of London, England.

III. ELECTION OF OFFICERS

Dr. Jean A. Curran, chairman of the Nominating Committee, reported that in accordance with the Constitution there was one office to fill, that of Secretary-Treasurer, and that the Committee had unanimously nominated the present incumbent, Dr. John B. Blake. There being no further nominations, the Association, upon motion duly made and seconded, unanimously elected Dr. Blake to the office of Secretary-Treasurer.

IV. REPORT OF THE JOHNS HOPKINS UNIVERSITY

The Secretary transmitted to the membership of the Association the following financial statement with regard to the *Bulletin of the History of Medicine.*

The Johns Hopkins University March 25, 1957

BULLETIN OF THE HISTORY OF MEDICINE

Income and Expenditures for Year 1956

Receipts:

Subscriptions—Members A. A. H. M.		$ 2,770.37
Subscriptions—To The Johns Hopkins Press		2,567.75
Single Issues		526.39
Reprints		321.95
Advertising		97.75
		$ 6,284.21

Expenditures:

Printing — Issue # 1	$ 919.45	
Printing — Issue # 2	847.05	
Printing — Issue # 3	871.39	
Printing — Issue # 4	1,091.90	
Printing — Issue # 5	859.11	
Printing — Issue # 6	1,089.88	$ 5,678.78
Additional Reprints		299.03
Commission to Press		2,108.75
Commission to Sales Agents		40.38
Miscellaneous Expense — Conversion Charges		.70
Assistant Editor		2,332.00
		$10,459.64
Funds expended by The Johns Hopkins University:		$ 4,175.43

The Johns Hopkins University

Richard H. Shryock, *Institute of the History of Medicine*

John H. Gilliece, *Assistant Treasurer & Comptroller*

V. REPORT OF THE AUDITING COMMITTEE

Dr. Linden F. Edwards, chairman, reported that the Auditing Committee had examined the books of the Association and found them correct and in good order. Upon motion duly made and seconded, the Association accepted the report.

VI. REPORT OF THE COMMITTEE ON INCORPORATION

Dr. John B. Blake, chairman, reported that at the time of the last annual meeting the Executive Committee of the Association had directed him to look into the question of incorporating the Association, with particular reference to its possible effect in encouraging gifts. As a result of his preliminary investigations Dr. Blake reported to the Executive Committee that in his opinion there were several reasons for believing that incorporation might be desirable, and he recommended the appointment of a committee to investigate the question further, with power to engage

counsel. The Executive Committee accepted this recommedation, and authorized the President to appoint such a committee on incorporation. The President appointed Dr. George W. Corner, Dr. George Rosen, and Dr. John B. Blake, chairman. This committee thereupon sought the advice of Mr. Abraham Wilson, of the firm of Kadel, Wilson & Potts, in New York City, an attorney with considerable experience in the affairs of nonprofit corporations and associations. On the basis of his opinions, this committee urgently recommended to the members that the Association be incorporated under the Membership Corporation Law of the State of New York. In accordance with the provisions for amending the present Constitution of the Association, this recommendation was forwarded to the Secretary-Treasurer more than sixty days in advance of the Annual Meeting, and by the Secretary-Treasurer to the members more than thirty days in advance of said meeting, together with the text of a proposed resolution to incorporate the Association.

In support of this proposal Dr. Blake then read the following extract from a letter from Mr. Wilson:

We enclose memorandum dealing with the difference between an unincorporated association and a membership corporation.

It was our original intention, as expressed to you, to present an objective study of the subject without vouchsafing a recommendation. However, after we considered the matter in the light of your particular situation, we were persuaded that there were hazards involved in the conduct of an unincorporated association which made continuance in that form wholly unrealistic. Because of the danger of personal liability, to mention only that phase of it, the expense involved in changing the form of your organization is well merited.

The memorandum referred to points out among other things that:

(a) The individual members of an unincorporated association may be personally liable for its debts, obligations, contracts and for damages for personal injury, whereas the members of an incorporated membership corporation are not.

(b) An unincorporated association cannot take bequests or devises, whereas incorporated associations may.

After some discussion concerning the mechanism of incorporation and the size of the Board of Directors or Council, it was voted that should the Association decide to incorporate, then the Articles of Incorporation should if possible be so worded with respect to the size of the Council that the Council could, after incorporation, be equal in size to the present Council, if the members so voted.

Dr. G. Kasten Tallmadge then suggested that this might be a good opportunity to change the name of the Association to one that was grammatically correct. Upon motion duly made and seconded, it was voted that should the Association incorporate, its name be changed at the time of incorporation to American Association for the History of Medicine.

After further discussion, in which it was pointed out among other things that the Association had sufficient funds to pay for incorporation, it was duly moved and seconded that the resolution proposed by the Committee on Incorporation be passed, and accordingly the Association unanimously

Resolved, That the President be directed to appoint a Committee of Incorporation to consist of nine Active Members of the Association with power to incorporate the American Association of the History of Medicine in the State of New York as a nonprofit membership corporation, and said Committee is hereby empowered and directed, on the vote of a majority, to take whatever legal and practical steps are required to effectuate the said incorporation and to execute and file all necessary documents.

Thereupon the President, Dr. Benjamin Spector, appointed the following Committee of Incorporation: John B. Blake, chairman, George W. Corner, Jean A. Curran, John F. Fulton, Iago Galdston, Ralph H. Major, George Rosen, Owsei Temkin, and Henry R. Viets. Upon motion duly made and seconded the Association ratified the appointment of this committee.

VII. OTHER BUSINESS

Dr. W. F. Norwood reported to the members on the invitation that had been issued by the Society for the History of Medical Science, Los Angeles, and the Barlow Society for the History of Medicine, to meet in Los Angeles in 1959, and urged favorable consideration of this invitation.

Dr. Lloyd G. Stevenson proposed a vote of thanks to the Medical College of Virginia Foundation, the Richmond Academy of Medicine, the College of William and Mary, and the Committee on Local Arrangements for their gracious hospitality and their many other contributions to the success of the meeting. This motion was carried by acclamation. Thereupon the meeting was adjourned sine die.

JOHN B. BLAKE, *Secretary-Treasurer*

NOTES AND COMMENTS

THE EARLIEST DESCRIPTION OF PARALYSIS DUE TO MULTIPLE NEURITIS FOLLOWING DIPHTHERIA

MADELAINE R. BROWN

"The Angina Suffocativa" was the title chosen by Dr. Samuel Bard for an essay on an epidemic of sore throat which prevailed in New York in 1771. (1) Included in this essay is the first known description of post-diphtheritic paralysis of the extremities. It happens also to be one of the earliest mention of any variety of polyneuritis, antedating Lettsom's description of alcoholic polyneuritis by 8 years. (2) The patient was a two and a half year old girl who was seen about one week after the onset of a membranous sore throat. Two very large blisters were applied behind the ears to meet at the throat. Fifteen days later she had loss of voice and difficulty in swallowing liquids. "This left her but her weakness and lowness of voice continued a much longer time so that in two months she could hardly walk alone or speak in a tone above a whisper."

Not until the middle of the 19th century, however, was it common knowledge that diphtheria could cause paralysis of the extremities. At this time several epidemics swept England and the continent and many articles appeared in the medical literature. Peter Eade (3), in the *Lancet* for 1859, described four patients who became paralyzed following diphtheria. Trousseau (4) devoted a chapter of his *Lectures on Clinical Medicine* to paralysis in diphtheria and stated therein that in 1860 Maingault (5) in his survey of the literature covering ninety patients had finally established the relationship on firm ground.

REFERENCES

1. Bard, S.: *An Enquiry into the Nature, Cause, and Cure, of the Angina Suffocativa, or Sore Throat Distemper, as it is commonly called by the inhabitants of this city and colony,* S. Inslee and A. Car, New York, 1771.
2. Lettsom, J. C.: Some Remarks on the Effects of Lignum Quassiae Amarae, *Mem. Med. Soc. London, 1*: 128, 1779-1787.
3. Eade, Peter: Cases of Paralysis as a Sequella of Diphtheria, *Lancet, 2*: 56-58, 1859.
4. Trousseau, A.: Paralysis in diphtheria, *Lectures on Clinical Medicine, 2*: 539-658, New Sydenham Soc., London, 1868.
5. Maingault, V. P. A.: *De la paralysie diphthérique,* J. B. Baillière et Fils, Paris, 1860.

MEDICO-HISTORICAL NEWS AND ACTIVITIES

ANNOUNCEMENTS

AMERICAN ASSOCIATION OF THE HISTORY OF MEDICINE

First Pan-American Congress of the History of Medicine

Through its Perpetual President, Dr. Ivolino de Vasconcellos, the Brazilian Institute of the History of Medicine has announced that the dates of the First Pan-American Congress of the History of Medicine, previously scheduled for October 12-20, 1957, have been changed to April 12-20, 1958. The new date coincides with the 150th anniversary of the foundation of medical teaching in Brazil. To commemorate this event, and to enrich the scientific and cultural interest of the Congress, the Organizing Commission has decided to include as an official theme, besides "Pre-Columbian Medicine," "The History of Medical Teaching in Brazil, in the Americas, and in Europe."

Other arrangements remain as previously announced in this *Bulletin*, September-October 1956, pp. 477-478.

NATIONAL NEWS

American Academy of the History of Dentistry

The sixth annual meeting of the American Academy of the History of Dentistry will be held at the Eden Roc Hotel, Miami, November 1, 1957. A morning session, a luncheon, and an afternoon session followed by a business meeting are provided in the tentative program which is detailed in the May 1957 issue of the *Bulletin of the History of Dentistry*. Apart from a presidential address by Samuel R. Parkes, addresses are foreseen by Arthur L. Irons, "History of the Army Dental Corps"; John B. Blake, "New Hall of Dental History, Smithsonian Institution, Washington, D. C."; Arthur H. Merritt, "Early American History Depicted by Old Blue China"; M. B. Vernado, "Life and Works of Dr. C. Edmund Kells."

American Council of Learned Societies

The American Council of Learned Societies, 2101 R Street, N. W., Washington 9, D. C., announces three programs of awards, each of which will also consider projects in the history and philosophy of science, and projects in the social sciences and natural sciences which have a humanistic emphasis:

1. A sum of $100,000 for Fellowship grants not to exceed $7,000 each for tenure during the academic year 1958-1959: "To provide opportunities for younger scholars to complete research projects in the humanities or to extend their competences by intensive study in a field or fields related to their areas of special interest."

2. $100,000 for grants to aid "significant humanistic research in progress"

during the academic year 1958-1959. A limited number of grants will be considered for 1957-1958. The grants will provide varying amounts, depending on need, not to exceed $3,000 each.

3. A limited number (ten) of Special Awards of $10,000 each will be granted for 1958-1959 "to make possible the completion of distinguished works in the humanities."

American Institute of the History of Pharmacy

The seventy-fifth birthday of Dr. George Urdang on June 13, 1957, was celebrated by a dinner staged by the American Institute of the History of Pharmacy, which Dr. Urdang helped to found in 1941 and which he had served ever since as Director. The University of Wisconsin community likewise took a prominent part in the celebration for its eminent pharmacist, who had retired just five years ago as professor of the history of pharmacy. An oil portrait of Dr. Urdang, painted by Robert Thom of Detroit, was unveiled by Mr. Bender representing Parke, Davis and Company, by whom the painting had been commissioned. The dinner was attended by about 85 of Dr. Urdang's associates who could reach Madison on his birthday.

Dr. Urdang had asked to be relieved of active direction after his seventy-fifth birthday for reasons of age and health. Accordingly, on July 1, 1957, the American Institute of the History of Pharmacy came under new leadership when Glenn Sonnedecker succeeded George Urdang as Director. Dr. Sonnedecker, a former pupil of Dr. Urdang, had served the Institute as Secretary since 1949, and in 1952 he had succeeded his teacher as professor of the history of pharmacy at the University of Wisconsin.

Award in the History of Chemistry

The Dexter Chemical Corporation Award in the History of Chemistry, administered by the American Chemical Society's Division of History of Chemistry, will be given for 1957 to Mr. Williams Haynes. Presentation of the award to Mr. Haynes will be made September 11, during the Society's 132nd national meeting in New York City.

Medical Americana

Mr. Robert B. Austin, Assistant Chief of the Reference Division of the National Library of Medicine, is compiling a check-list of medical Americana, scheduled for publication early in 1961. Any library having pre- 1821 American medical imprints, or imprints pertinent to the early history of medicine in the United States, is invited to make the fact known to Mr. Austin, so that locations of copies can appear in the list.

National Library of Medicine

"New Loan and Photoduplication Mechanisms to be effective September 1957" are announced in the Library's *News* of June 1957. One of the important points is the restriction of original material as well as photocopies to inter-library service if requested outside the library. "Individuals coming to the Library must use the material on the premises." Moreover, "original material from the History of Medicine Division is to be used within the borrowing library exclusively."

Tercentenary of the Death of William Harvey

The National Library of Medicine and the National Heart Institute are sponsoring a symposium on the circulation of the blood at the NIH Clinical Center, Bethesda, Maryland, on September 17, 1957. The morning session will be devoted to historical aspects of the discovery of the circulation of the blood. An exhibit on Harvey for this symposium is being planned by a committee and various cooperating institutions. A descriptive catalogue is in preparation of the exhibit which will be shown at the National Institutes of Health in September, then at the National Library of Medicine, and certain portions subsequently at the Smithsonian Institution and in the Medical Museum of the Armed Forces Institute of Pathology.

The April 1957 issue of the *Journal of the History of Medicine and Allied Sciences* has been devoted to the Harvey Tercentenary.

University of Kansas Medical Center

The eighth series of the Logan Clendening Lectures will be given by Dr. Ralph H. Major in the fall of 1957 at the time of the dedication of the new library building. The first lecture, on "Disease and Destiny," will be delivered in Lawrence, the second, on "Logan Clendening," will be given in Kansas City.

Personal

As of August 1, Dr. George Rosen is assuming the editorship of the *American Journal of Public Health.*

NEWS FROM ABROAD

Japan

The 59th annual congress of the Japanese Society of Medical History was held on March 31, 1957, at the Osaka University School of Medicine in Osaka. Special lectures given were: "Medical System of the Emperor's Government in the Era of Tokugawa Shogunate," Tasuku Yamazaki; "Studies on the Revision by the Emperor of the Medical Classics in Sung Period," Tamendo Okanishi. In addition, 21 reports were given, also chiefly dealing with topics relating to the history of Japanese medicine. Eighty members attended the meeting, at which historical material was exhibited.

BOOK REVIEWS

Indian Journal of the History of Medicine. Editor: D. V. Subba Reddy. Vol. 1, no. 1, June 1956. Published twice a year (June and December) for The Indian Association of the History of Medicine, 187 Poonamallee High Road, Madras 7 (India).

The aim of the new *Indian Journal of the History of Medicine* is described as follows on the back cover:

"The Journal will be devoted primarily to the promotion of the study and research in the History of Medicine, including philosophical, sociological, cultural and humanistic background, as well as the changing influences and new trends. It will endeavour to bring to the notice of the cultured public and the profession, various Archaeological, Epigraphical evidences, traditional lore, extracts from ancient literature, religious or secular or scientific, lists of manuscripts, records of documents, old books and works of art, useful for the study of history of Medicine in India. It will collect and publish clues and traces of the influence of ancient Indian Medicine on other lands and people of ancient and mediaeval times. It will attempt to critically examine the influence of European Renaissance and European Medicine on the advent and growth of modern medicine in India, with far-reaching repercussions on the Indigenous systems and on the health of India. It also aims to bring Medical Science into closer relation with Humanism."

The first issue shows a promising beginning, as indicated by the titles of the main articles: "Ayurveda and Foreign Contacts" (a lecture by Professor Filliozat which he delivered in August 1955); "The Concept of Heart and Blood Vessels in Ancient Hindu Medicine" (P. Kutumbiah); "Training for Medical Practice in Ancient India" (M. Visweswara Sastry); "Arabian Medicine" (Syed Tajuddin); "Nursing under Ancient Indian Systems" (K. K. Radhalaxmi and M. N. Rao); "Buddha's Discourses on Medicaments, Treatment and Nursing" (D. V. S. Reddy); "Rhazes's Magnum Opus 'Al-Hawi' or Continens" (by M. Nizamuddin, the editor of the Arabic edition that is in course of publication). In addition, the journal carries notes on various medico-historical activities of past and present. The subscription in India is Rs. 8/- per year, and outside India foreign currency equivalent to Rs. 12/-. Dr. Subba Reddy and the Indian Association of the History of Medicine are to be felicitated on the enthusiasm and energy which made the appearance of this new journal possible. It will undoubtedly be a very important means of furthering the history of medicine in India.

OWSEI TEMKIN

Avicenna. *Poème de la Médecine*. Texte arabe, traduction française, traduction latine du XIII^e siècle avec introductions, notes et index, établi et présenté par Henri Jahier, Abdelkader Noureddine. Paris: Les Belles Lettres, 1956 (Collection Arabe, Publiée sous le patronage de l'Association Guillaume Budé). xii + 209 pp. Ill. 2,800 French francs.

Among the medical works of Avicenna (Ibn Sīnā), the poem on medicine probably was the most widely read. Written in the iambic meter known as rajaz, the *'Arjūzat fī-l-ṭib* was translated into Hebrew and into Latin. The first Latin translator may have been Gerard of Cremona (see p. 101), and around 1284 Armengaud certainly translated the poem together with the commentary of Averroes. Armengaud's translation was revised by Andreas Alpago.

The present book gives an Arabic edition of the *'Arjūzat* on the basis of four manuscripts, in juxtaposition with a French translation. This part is followed by a reprint of the Latin edition published in 1556 by Hervagius in Basel under the title: "Cantica Avicennae a magistro Armengando Blasii de Montepesulano ex Arabico in Latinum translata, cum castigationibus clarissimi philosophi ac medici Andreae Bellunensis." Both Arabic and Latin editions are suitably introduced. Criticial notes and variants from the Arabic prints of Calcutta (?) 1829, and Lucknow, 1845, together with an index conclude the book.

This poem on medicine is one of the best outlines of Arabistic medieval medicine. As Avicenna's preface indicates, it was intended for study by high ranking laymen. It comprises the whole realm of medicine, ranging from the four elements to the treatment of fractures and dislocations. In broad lines, the arrangement follows the divisions of Hunain ibn Ishaq's *Isagoge*. The present book allows not only a convenient access to medieval medical thought, but by including in one volume Arabic text and Latin and French versions, permits a comparison of Eastern and Western terminology.

The Latin version should be taken into account by those readers who do not know Arabic, since the French translation often is very free and misleading. Thus the important definition of medicine (verse 17 of the Arabic text) is rendered in Latin (p. 110) as "Medicina est conservatio sanitatis, et curatio aegritudinis, quae accidit ex causa quae in corpore existit." This is better than "La médecine est l'art de conserver la santé et éventuellement de guérir la maladie survenue dans le corps." The second hemistich of verse 20 reads: *min marad wa'arad wasabab*, "they are disease, symptom, and cause." The translation "Ce sont: les Conceptions générales, la Pathologie, les Causes" is not motivated, especially since on p. 32 *'arad* is correctly rendered by "symptôme." I cannot see the reason for translating verse 23, which names the elements as part of the *res naturales*, by: "Les composants naturels sont les facteurs constitutifs des corps." In their critical notes the editors discuss the term *rukn* (*'arkān*) "element" in connection with verse 23. Why circumvent it in the translation? The Latin translation (p. 111), "Proculdubio ex rebus naturalibus sunt elementa, ex quorum compositione existunt corpora" appears closer to the meaning.

In their introduction to the Latin part, the editors give intereresting examples of the difficulties which the Arabic script presented to the medieval translators.

Unwittingly, the editors themselves offer an illustration of this difficulty. In the table entitled "Ex-Libris d'Avicenne," (facing p. 10), reproducing the title of a Galenic work, the legend transcribes and translates it as *fī qūwat al-Ṭibb etc.* ("sur la puissance de la médecine"). Actually it has to be read *fī firaq al-ṭibb* (On the sects of medicine).

Although the books has to be used cautiously by those relying on the French text alone, its value is nevertheless great for all students of medieval medicine.

OWSEI TEMKIN

ALEXANDRE KOYRÉ. *From the Closed World to the Infinite Universe.* Baltimore: The Johns Hopkins Press, 1957. xii + 313 pp. Ill. $5.00.

One who had the privilege of Professor Koyré's courses at Hopkins of which he speaks in the Preface to this book may perhaps hear in the printed page more of the deft interestedness and interestingness of the lecturer than is there for other readers, but the tone seems authentically there for anyone, together with the advantages—and despite Plato there are some—of print. One phrase refound is "He is perfectly right"; with then perhaps qualification of the "perfectly" or more often of the limits of that with respect to which the author in question is "right" or of the basis in relation to which he is right. And this may be suggested as typical of Professor Koyré's excellence: given his scholarship there is added a cordial sympathy of insight into the man's contention together with a recognition of its limitations to then-known facts and of the background of acceptances which give the contention warrant and warmth.

We have come to see how much more conflict and equivocality of direction there was in the Seventeenth Century than we used to allow for apart from theological and church and political disputes. But most of the work here has been from the side of literature or the general history of ideas. Professor Koyré's book contributes to a clarification of the role of science in this period; and surely it was a period when science was not only vigorous in its own life but widely and potently influential. That science was thus influential was in part due to the newness of its astronomy, particularly its astronomic cosmology—that which has always caught and swayed the imagination of men in all their larger interests. This story of Seventeenth Century astronomy-cosmology Professor Koyré tells from the viewpoint of a special question: Is the world closed or open, finite or infinite, hierarchical or indifferent?

Just how it is that astronomy can be individual and formal-universal, a meeting of history-geography and physics, a dramatic mathematics; and how this unique duplicity is associated with astronomy's power over the imagination and indeed also with the antinomies of the open-closed debate of Professor Koyré's book—all this deserves its own, another, book. And another book, of course, could be occupied with the many and slippery meanings for "world," "universe," "space," "extension," and for the applications to them of "closed," "open," "infinite," "indefinite." Professor Koyré does not attempt a careful analysis of possible notions but is by no means unaware of them. And he is not unaware that some of

these equivocalities as well as some uncertainty of history attach to the simple opposition of the "open" world of Plato and the "closed" one of Aristotle which is set up and accepted as a simple backdrop for the Seventeenth Century story. Doubtless our history will not be understood until our metaphysics and semantics are adequate; but the latter cannot be hoped for except with the aid of history; and neither can just wait for the other.

The central and most variously important issue, I take it, both for this book and for actual history, is as to whether, in Professor Koyré's word, there is anything "hierarchical" in the structure, arrangement, or lack of structure or arrangement, of the spatial universe. The word "hierarchy" is not altogether happy except in its readiness through wide usage. It does somewhat better for the question of superior and inferior stuffs (say of earth and heavenly bodies as appears in Galileo's *Two World Systems*) than it does for the question of pattern involved here. Is there or is there not a pattern to set up areas of uniqueness? Any pattern invites correlation with other known patterns, and, within the rules of probability, legitimate correlation. The human brunt is whether there is any uniqueness in the universe-place of man, who for us, as men, has a privileged place in many of our other patterns.

And here perhaps Professor Koyré's book makes its best contribution in the clear presentation of the view of Kepler, who takes the side contrary to that which was becoming and has become securely orthodox modern science. And Kepler sees what he is opposing, the thesis of non-uniqueness, as entailed by an infinite universe, so that his argument will also demolish the thesis of an infinite universe. Kepler argues, with carefully detailed and measured astronomical facts, that "this place, in which we are, will always have a certain peculiarity that cannot be attributed to any other place" and that "this place is singular and notable compared to all the remaining parts of the region of the fixed stars." (Quoted pp. 67, 82 from *De Stella Nova* 690 and *Epitome astronomiae Copernicanae* 138.)

This presentation is helpful to the general story, it is not familiar, it is typical of the frequent helpfulness of Professor Koyré's careful presentation of unfamiliar or too easily accepted texts; and, besides, it is a fine lesson in the superb literalness and factuality with which Kepler, that prince of imagination and suggestion, will argue for and from the exact meaning of a proposed assertion. It may have been born of the heard-unheard harmony of the spheres but it better state itself clearly and face the test of literal deduction, observed facts, and precise measurements.

The chief man left out may be Bacon who on most of these topics, especially the inside and outside vacuums, has many worthwhile things to say.

Other notable junctures in the argument are Descartes's spatialization of matter and the criticisms of Newton's space and time by Berkeley and Leibniz. And with the Newtonian triumph, Professor Koyré, who has stuck scientifically to his story of science and its associated philosophy, takes leave of the story with a very pretty phrase which shows his awareness of the value ideas beyond the descriptive: "The infinite Universe of the New Cosmology . . . inherited all the ontological attributes of Divinity. Yet only those—all the others the departed God took away with him."

ALBERT L. HAMMOND

MARIA ROOSEBOOM. *Microscopium*. Leiden: Rijksmuseum voor de Geschiedenis der Natuurwetenschappen, 1956. 60 pp. Ill.

Seneca, in the 1st Century A. D., knew that "Characters, however small and obscure they may be, are seen larger and clearer through a glass sphere filled with water." Galileo constructed his telescope in 1609 after hearing rumors of the existence of such an instrument in Holland. The inventor of the microscope, the time and place, are not definitely known. Constantijn Huygens, however, reported seeing a microscope in London in 1621 on his visit to Cornelius Drebbel, "court inventor" to King James I. Drebbel's son-in-law took such an instrument to Italy and in 1625 it was given the name of "Microscopium."

The book *Microscopium* by Dr. Maria Rooseboom, Curator of the National Museum for the History of Science in Leyden, Netherlands, is a beautiful volume. Publication was made possible by the generosity of Messrs. Pfizer Ltd., of Rotterdam. A small folio of fifty-nine pages of coated heavy stock, it contains 115 illustrations, including nine full page plates, of which five are in color.

In a work of this size no discussion can be very detailed but the salient points in the history of microscopy are covered. A period of discovery by the classical microscopists such as Malpighi, Hooke, Swammerdam, de Graaf, and Leeuwenhoek (d. 1723) was followed by an era in which the instrument was not much more than a toy for dilettantes. The discovery of the achromatic objectives in the first half of the 19th century provided the necessary stimulus to further serious work. Chromatic and spherical aberration, which had previously caused distortion of the images, was being overcome and the resolving power was being increased. During the latter half of the 19th century the work of Pasteur and Koch, among others, in their discoveries of the pathogenic bacteria emphasized the great practical and social value of microscopy.

In the first chapter, "The Optical Part of the Microscope," the author gives an excellent succinct account of the evolution of the optical system used in the present microscopes.

The second chapter deals with illumination of the object by reflected light. In 1665 Robert Hooke illuminated the object by concentrating the light of a small oil lamp with a glass globe filled with water and then a small convex lens. The following chapter discusses illumination by means of transmitted light. Although Descartes, in 1637, used both a mirror for reflected light and a condenser lens for transmitted light, Christiaan Huygens, in 1678, first made practical use of a condensing lens for illumination with transmitted light. The Van Musschenbroek's of Leyden were the first to use interchangeable diaphragms in the 17th century, and Hertel in 1716 used the first adjustable sub-stage mirror. Dark-ground illumination is briefly discussed, and polarized light barely mentioned.

An interesting chapter on "The Simple Microscope" points out the value of this instrument to the "classic" microscopists. Leeuwenhoek used ground lenses while others, such as Hooke, Hartsoeker, and Huygens, used "small glass spheres made by melting."

The physician will find the next chapter, on "The Microscope and Medical Science," too short. The first outstanding result of investigation after discovery of the achromatic objectives about 1830 was the formulation of the cell theory by

Schleiden (1838) and Schwann (1839). Virchow's *Cellular Pathology* followed soon after in 1858. The science of bacteriology had a slow start at mid-century, but following Koch's invention of the pure culture technique on solid media, in 1878, it grew at a rapid pace. The microscope had by now found its rightful place in science.

"Arrangements for Focusing" in compound and simple microscopes are covered. In "The Movement of the Object with Respect to the Lens" it is noted that Hertel described a mechanical stage as early as 1716. In the English scopes the upper plate of the stage was movable while in the Continental instruments only the side clamps were movable.

There is a chapter on the "Stand and Foot," another on "The Binocular Microscope," and a final one on "The Phase-Contrast Microscope."

A chronological list of discoveries of importance for medical science vividly demonstrates that the microscope has been responsible for modern scientific medicine.

A bibliography of twenty items concludes the work.

The author frequently mentions that the stimulus for the instrument makers was provided by the microscopists who were not content with the blurred images, the lower powers of magnification, the limited resolving power, the cumbersome and unsteady stands, etc. As the science progressed, so the demands grew for better instruments to view the handiwork of God.

Robert Hooke's *Micrographia,* published in 1665, is referred to as the first illustrated book on microscopy. Federico Cesi, however, chief of the Accademia dei Lincei, conceived the idea of publishing his *Apiarium* on the honeybee in honor of Pope Urban VIII, a member of the Barberini family, whose crest contained three honeybees. Francesco Stelluti, a naturalist and poet, engraved a plate for this work in 1625. Five years later he published his *Persio. Tradotto in verso sciolto e dichiarato da Francesco Stelluti.* Printed in Rome by G. Mascardi, it reported scientific studies with the microscope and contained engravings illustrating the morphology of the honeybee and the grain weevil.

The tabular historical synopsis relating the development of the microscope to important events in politics, art, physics and chemistry, economy, biology, and medicine is too brief to be of much value. This space could have been better utilized to discuss other features in greater detail.

An unavoidable inconvenience is the frequent reference to illustrations several pages from the text.

Figure 61 is not numbered nor is there a legend. On page 48, the date of the Martin scope is given as about 1740, whereas in the legend to an illustration on the same page and to one on page 30, it is given as 1750.

The syntax is occasionally awkward. This may well have occurred as a result of translation.

A table of contents or index would have increased the value of the book as a reference work.

These criticisms are all of a minor nature and do not seriously detract from the interest and beauty of the volume. It is a fine production and will delight anyone interested in microscopy.

HENRY H. FERTIG

DAVID LEVAY. *The Life of Hugh Owen Thomas.* Edinburgh and London: E. & S. Livingston (Baltimore: Williams & Wilkins), 1956. vii + 135 pp. Ill. $6.00.

This is an admirable study of Hugh Owen Thomas. He seems to live again surrounded by his friends and numerous patients. At times the description becomes so realistic that the reviewer had a feeling of personal acquaintance and professional contact. Yet the author states in his introduction that the book was written "without a conscious initial decision to undertake it." Perhaps, the author was under a subconscious spiritual compulsion which permitted him to recreate Thomas as a human being and a great clinician.

The medical historian and the orthopedic surgeon should both be grateful for this study to the author who had a happy opportunity to use authentic material and letters as well as private papers belonging to Thomas and members of his family. Thomas is placed in proper relation to his medical predecessors and contemporaries which throws some light on their achievements. Interesting facts are revealed concerning the works and state of contemporary orthopaedic surgery.

Factors which might have been responsible for the creation of such a complicated figure as Thomas are brought to light. The author quotes an interesting characterization of Thomas by T. P. McMurray: "The facts of his life are few. We may all, in our minds, fill in the pattern of his personality. Each of us, from a different angle, may interpret his restlessness, his impatience, his brusqueness, his sympathy, his devotion to his task, and his passion for truth, as he conceived it."

Thomas was apparently more remarkable than one might conceive at the present time. Ridlon relates that on "one Sunday, five women came in with deformed wrists from badly treated Colles' fractures. The wrists were refractured, the deformity corrected, and the arms splinted, not only without an anaesthetic but without their being told that their arms were to be broken again."

The author emphasizes Thomas' untiring and unremitting attention to detail, his avoidance of keeping the patients in hospitals but for the briefest time. His results in tuberculosis of the hip compare favorably with almost the best obtainable now.

The names of great men in medicine, as elsewhere, are quickly forgotten by practitioners of the art. With these names, the basic ideas are also lost in the maze of fads and passing truths. It is imperative to bring them out of the past. The author's study does more than this. In addition to revealing the man, it brings to life the ways and principles of orthopaedic surgery. Although the book is only 136 pages long, it is written in beautiful, almost poetic, prose with enlightening classic references. It is embellished with 13 plates and as many figures and two important maps showing the area of North Wales with geographical locations connected with the ancestors of Thomas.

It is an ardent wish of the reviewer that this important book reach the budding and the active orthopaedic surgeon as an incentive to emulate the great pioneer and to preserve devotion to guiding principles in the practice of the Art.

EMANUEL B. KAPLAN

ERWIN STRAUS *Vom Sinn der Sinne.* (Ein Beitrag zur Grundlegung der Psychologie.) [The Sensibleness of Sense. (A Contribution to the Foundation of Psychology.)] Second edition. Berlin, Göttingen, Heidelberg: Springer-Verlag, 1956. ix + 425 pp. D. M. 39.60.

This is an unusual book. The mere fact that twenty years went by before the time seemed ripe for a second edition already indicates this.

To the original three sections, reprinted almost unchanged, a few chapters and an entirely new part have been added. In this third part of the new edition the author sums up the literature since 1936. It is a searching critique of some fundamental tenets of "objective psychology" as well as a concise formulation of the author's concepts. The telling title of this part, "Man Thinks—Not the Brain," gives a clue to E. Straus' basic orientation: The great theme of psychology is a self which relates itself to the world and not an organism reacting to stimuli in the field around it. Accordingly, the book is not about sensations but about "sensing" as a sympathetic experience.

It is the author's contention that even today the concepts of objective psychology are partially determined by the methodological and ontological ideas of Descartes. A critique of these ideas therefore opens the book, but throughout the work Erwin Straus is tracing back to Cartesian philosophy the theories of its early opponents as well as of its followers in the 19th and 20th century. These historical reflections will be of special interest to readers of this *Bulletin*.

Descartes' separation of the *res cogitans* from the *res extensa* leads not only to a separation of mind and body. The mind is principally separated from the world, and the sensations participate in this extramundane status of the mind. The relation of the subject to sensations is that of pure reception. In this concept epiphenomenalism has its roots. Modern psychology looks upon the object of sensing as if it were an object of cognition; it considers the sensing subject as if it were the subject of recognition, and it holds that the mode of communication corresponds entirely to that of cognition.

The turning away from the everyday orientation, from the natural confidence in the sensory experience and its certainty, the turning to a worldless, bodyless consciousness is soon accepted as self-evident. At the same time this disembodied consciousness is spoken of as "our" consciousness. The subject has sensations but it does not sense. The pre-logical, pre-scientific sphere of the immediate experience of reality is entirely left out. The solipsism inherent in Descartes' theory is interpreted as a psychological factum. In this form it has exercised its influence through the centuries. Freud's concept of reality testing is an attempt to find a solution to the problem which Freud took over from tradition as a self-evident fact. The Id and the Unconscious are solipsistic conceptions, late descendants of Cartesianism.

If sensing is a mode of the living being, then it must be comprehended under the category of Becoming. To it belongs change, transformation, direction and continuity.

Yet objective psychology extended the ontological determinants of the world of things more and more to all, that is, including the being of psychic life. Thus in the end, empirical psychology was subjected to objective categories and included

in the spatial and temporal order of physics. The last consequence of this development of psychology is the creation of the atomistic concept of time. No matter whether psychology begins as elementarism with the sensations or starts out with the *Gestalten*, as long as it has not overcome the atomistic view of time it remains an atomistic psychology.

Pavlov's reflex theory, too, is a late fulfillment of the Cartesian philosophy. Pavlov overlooks the fact that he is not at the beginning but at the end of a long development of occidental thinking. He, too, did not overcome the tendency to isolate sensations; yet, against his own fundamental conviction, in making the connection between sensorium and motorium a problem he has taken a step to free the sensations from their isolation. While Pavlov's observations remain unchallenged, the refutation of his theory provides the author with an opportunity to develop his own concepts. This reviewer regrets that he cannot record in detail the author's arguments step by step. Pavlov, finding himself confronted by the fact that his own observations were no longer in harmony with his theory, introduced several additional hypotheses to save it. Erwin Straus, in the relentlessly searching way which characterizes this as well as his many other works, shows how "five difficulties" which had led to Pavlov's hypotheses are dissolved if one realized that the relations of a living being to the world cannot be explained as events within the organism, nor the situation as site, nor becoming as a succession in objective time. Indeed, the phenomena, which Pavlov calls conditioned reflexes, cannot be reflexes at all. Reflexes are events within the organism. Those phenomena which are considered conditioned reflexes can only be understood as the modes in which animated beings behave towards the world.

How then must sensing be constituted that in its field such experiences as "Approaching" and the phenomena of "Between," "Caesura," "Emptiness," can become real and actual? This fundamental question finds its answer in the final part, bearing the title "Sensing and self-motion viewed historiologically."

It is beyond the scope of this Bulletin to analyze in this review the main issues and formulations of this part, though it is actually the most important one of the book.

There are many excellent chapters and the titles of some may be mentioned here in the hope that they will arouse the curiosity of at least a few readers: "On the theory of hallucinations," "The spectrum of the senses," "On being awake," "The characteristics of the signal."

Vom Sinn der Sinne is a very scholarly, wise and human book. Its phenomenological search, its ontological reflections are at variance with the objective psychology of our time. Although the author has apparently nothing of the prophet in him, his work may yet remain as a cry in the wilderness.

"The practical use of such investigations," Erwin Straus writes in his closing lines, "is smaller than that which natural science can produce in its research. Yet they may perhaps claim another merit for themselves. The knowledge which may be gained through them is not meant to control the world and make it subservient to man but to open the world. Out of a mute world it wants to make one that speaks to us from a thousand points. The abundance and manifoldness of the world in which we are living shall become audible to us where until now it has remained silent."

WALTER O. JAHRREISS

The Great Physiodynamic Therapies in Psychiatry. An Historical Re-appraisal. Edited by Felix Marti-Ibañez, Arthur M. Sackler, Mortimer D. Sackler, Raymond R. Sackler. New York: Paul B. Hoeber, Inc., 1956. xiv + 190 pp. Ill. $5.75.

This book breathes the joyous spirit of a new conviction: ". . . we are on the threshold of the bridge to the future, a future which will see the mystery of insanity revealed." This young hope rests on the old "concept of the primacy of biologic factors," promising "a neuro-endocrine pathogenesis of the psychosis." Such search for "the ultimate deviation out of which the disease process arises" is not an entirely new phase in psychiatry but rather "the revival of a naturalist tradition." Quite appropriately, the editors of this "symposium" open the book with a brief historical survey of the "organicist philosophy" in psychiatry, up to its "present day culmination in physiodynamic psychiatry."

There is no longer any reasonable doubt that, in this "era of metabolic psychiatry, the pendulum so long unbalanced by psychologic overemphasis" has begun "to swing back." Indeed, it might easily swing back too far and stay unbalanced again, but this time by physiologic overemphasis. Even this book, conceived in what is called "a philosophy of organicism" and based on the postulate of the primacy of biologic factors, contains some cautious warnings to this effect.

The lasting value of this symposium on physiodynamic therapies rests with the contributions on the "classical Sakel shock treatment" by Manfred Sakel; on the convulsive treatment with Metrazol, and the carbon dioxide treatment by L. J. von Meduna; the electroshock therapy by Ugo Cerletti and the prefrontal leukotomy by Egas Moniz. Each chapter is an autobiographical report on the development of these original therapies, from conception and concept through trials and revisions to the final method, to success and some after-thoughts. Coming historians of this era in psychiatry—and medicine—will thank the editors for their idea and their "love's labors." They will recognize anew the vision, the courage, and tenacity of these great physicians; they will note where they contradict each other; they will realize their short-cut theories and admire all the more their practical daring and therapeutic orientation. They will find also how each of these authors in stating his case reveals some traits of his own personality.

On nine pages Roy G. Hoskins succeeds to give a survey on Hormone Therapy. His relentless scientific scrutiny destroys much hasty hope: "the fruits that the explorers have brought back have failed to come up to their or our hopes." Yet, he also gives advice for future studies and leaves some hope: "Much shining new equipment is now at hand for setting forth other expeditions. Perhaps, in the days ahead new expeditions will yield fruits that even the earlier dreamers would find pleasing. The need remains. The researches should go on."

The book ends with a chapter by the editors on contemporary physiodynamic therapeutic trends in psychiatry. "These trends are illustrated in part by the work of one group of contemporary investigators, seeking to define the pathophysiology of psychiatric disorders." This group is represented by the editors of this book and other co-workers at the Van Ophuijsen Center in New York. Summing up and leading towards future research, this chapter again reflects the shining hope of their authors that "Psychiatric somatotherapies will make their greatest contribution to basic medicine, to physiology, and not merely to psychiatry."

WALTER O. JAHRREISS

THE BULLETIN RECENTLY RECEIVED *

John B. Blake. *Benjamin Waterhouse and the Introduction of Vaccination.* A Reappraisal. Philadelphia: University of Pennsylvania Press, 1957. 95 pp. $4.00.

American Institute of the History of Pharmacy. *Report of the Annual Meeting 1957.* Madison, Wis., American Institute of the History of Pharmacy, 1957. 16 pp. Ill.

Maurice Bouvet. *Les travaux d'histoire locale de la pharmacie en France des origines à ce jour.* Paris: Société de la Pharmacie, 1957. 43 pp.

G. Barbu, G. Brătescu, and V. Manoliu. *Aspects du passé de la médecine dans la république populaire Roumaine.* Iconographie. Bucarest: Institut de la Santé Publique et d'Histoire de la Médecine, 1957. 210 pp.

G. Barbu, G. Brătescu, and V. Manoliu (editors). *Istoria Medicinei, Studii şi Cercetări.* Bucarest: Editura Medicală, 1957. 460 pp. Ill.

D. De Moulin. Historical Notes on Vascular Surgery. *Archivum Chirurgicum Neerlandicum,* vol. VII, fasc. 3, 1955, pp. 218-226; fasc. 4, 1955, pp. 321-330; vol. VIII, fasc. 1, 1956, pp. 31-42.

Kenneth Dewhurst. *The Quicksilver Doctor.* The Life and Times of Thomas Dover, Physician and Adventurer. Bristol, England: John Wright & Sons Ltd., 1957. xii + 192 pp. 21 s.

Charles Dodds. *Biochemical Contributions to Endocrinology.* Experiments in Hormonal Research. Stanford, Calif.: Stanford University Press, 1957. 76 pp. Ill. $3.00.

Camille Dreyfus. *Some Milestones in the History of Hematology.* New York & London: Grune & Stratton, Inc., 1957. 87 pp. Ill. $4.50.

Marcel Florkin. *Un prince, deux préfets.* Le mouvement scientifique et médico-social au Pays de Liège sous le règne du despotisme éclairé (1771-1830). Liège: Imprimerie H. Vaillant-Carmanne, S. A., 1957. 308 pp. Ill. 320 Belgian francs.

Oscar P. Hampton. *Orthopedic Surgery in the Mediterranean Theatre of Operations.* Medical Department, United States Army: Surgery in World War II. Washington, D. C.: Office of the Surgeon General, Department of the Army, 1957. xx + 368 pp. Ill.

Emiliano Hernández Benito. *El saber oftalmológico en la medicina renacentista Española.* Salamanca, 1957. Publicaciones del Seminario de Historia de la Medicina de la Universidad de Salamanca. Serie A: Estudios. Tomo 1, Núm. 3, pp. 137-321.

Thomas Kelly. *George Birkbeck: Pioneer of Adult Education.* Liverpool: at the University Press, 1957. 380 pp. Ill. 45 s.

J. F. Smithcors. *Evolution of the Veterinary Art.* A Narrative Account to 1850. Kansas City: Veterinary Medicine Publishing Co., 1957. xvii + 408 pp. Ill. $6.50.

* The *Bulletin* reserves freedom of decision as to the publications to be listed in this section. Items received, other than those assigned for review, are ultimately incorporated into the collection of the Institute of the History of Medicine.

CONTRIBUTORS TO THIS NUMBER

JOHN B. BLAKE, Ph. D., Secretary-Treasurer of the American Association of the History of Medicine, is Associate Curator, Division of Medical Sciences, U. S. National Museum, Smithsonian Institution, Washington 25, D. C.

MADELAINE R. BROWN, M. D., formerly Associate in Research, Neurological Unit, Boston City Hispital, is now Neurologist at the Massachusetts General Hospital, Boston, Mass.

LUDWIG EDELSTEIN, Ph. D., is Professor of Humanistic Studies, The Johns Hopkins University, Baltimore 18, Md.

HENRY H. FERTIG, M. D., is Curator of the Howard Dittrick Museum of Historical Medicine, The Cleveland Medical Library, 11,000 Euclid Ave., Cleveland 6, Ohio.

L. A. GEDDES, M. Eng., is Director of the Laboratory of Biophysics, Baylor University, Houston 5, Texas.

ALBERT L. HAMMOND, Ph. D., is Associate Professor of Philosophy, The Johns Hopkins University, Baltimore 5, Md.

HEBBEL E. HOFF, M. D., is Professor and Chairman of the Department of Physiology, Baylor University School of Medicine, Houston 5, Texas.

WALTER O. JAHRREISS, M. D., is Medical Director, The Seton Institute, 6420 Reisterstown Rd., Baltimore 15, Md.

EMANUEL B. KAPLAN, M. D., is Associate Orthopedic Surgeon at the Hospital for Joint Diseases, New York City. His address is 1001 Grand Concourse, New York 52, N. Y.

SANFORD V. LARKEY, M. D., is Director of the William H. Welch Medical Library, The Johns Hopkins University, Baltimore 5, Md.

JOSHUA O. LEIBOWITZ, M. D., is a specialist in internal medicine and Lecturer on the History of Medicine at Hebrew University. His address is Soleil Boneh St. 7, Jerusalem-Katamon, Israel.

RICHARD H. SHRYOCK, Ph. D., is Director of the Institute of the History of Medicine, The Johns Hopkins University, Baltimore 5, Md.

MARY FRANCES WAGLEY (Mrs. Philip F.) lives at 21 Meadow Rd., Baltimore 12, Md.

PHILIP F. WAGLEY, M. D., Instructor in Medicine, The Johns Hopkins Medical School, Baltimore 5, Md., is in the practice of internal medicine.